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MARK FORECAST

Canadian Information Services Market

1993-1998

AUGUST 1993

CANADIAN INFORMATION SERVICES MARKET

1993-1998

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Abstract

This is INPUT's annual report on the Canadian information services market for 1993. It contains projections of growth for 1993 through 1998 for the processing services, applications and systems software products, turnkey systems, systems integration, systems operations, professional services and network services delivery modes. This report also analyzes the use of information services by selected industries, including discrete and process manufacturing, finance and banking, insurance, wholesale distribution, utilities, business services and the federal government. Interest in and potential use of technology, particularly client/servers, open systems, downsizing and outsourcing, is also explored.

Research for this report included intensive data gathering from 169 users about their current and projected use of information services, as well as interviews of selected vendors and reviews of secondary sources of information.

Despite continuing economic problems, results of the research indicate that some recovery is taking place in the Canadian economy, and it is having a positive impact on the use of information services. The reaction to NAFTA and competitive pressures in general are also encouraging more use of information services. However, current and planned increases in usage differ noticeably between market sectors (manufacturing versus insurance) and delivery modes (turnkey systems versus systems operations). Also, the impact of technology, particularly client/server systems, is more significant in some market sectors.

This report contains 140 pages, including 96 exhibits.

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***Canadian Information Services Market,
1993-1998***

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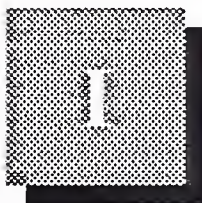
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Introduction

A

Purpose and Organization

1. Purpose

This report provides INPUT's 1993 forecasts for the information services market in Canada. It contains a review of 1992 results and estimated expenditures from 1993 to 1998 for the processing and network services, applications and systems software products, turnkey systems, systems integration, systems operations and professional services delivery modes. Included is a discussion of recent market issues, trends and technological factors that are influencing this market. In particular, plans for the use of client/server technology, open systems, downsizing and outsourcing will be discussed, as well as reasons for the selection of information services vendors.

This report concentrates on information services provided to a set of vertical markets including finance and banking, insurance, manufacturing, wholesale distribution, utilities, business services, and the federal government. Some attention is also given to the retail distribution and communications industries.

In the previous report, vertical market information was provided for five markets based on the interests of early subscribers. In this report, the number of markets analyzed on an individual basis has been expanded to seven, as listed above.

Limited information is also provided on an individual basis for two other markets, retail and communications.

2. Organization

This chapter (*Introduction*) describes the purpose and organization of the report. It contains a list of examples of above-average growth in the use of information services that can be found in the Canadian market. The remainder of this report is organized as follows:

Chapter II, *Executive Overview*, provides an overview of the business environment, discussion of changes in information technology (IT) budgets and projected use of information services, and analysis of the use of information services by vertical market and geographic region. A comparative rating of vendors by users and conclusions and recommendations arising from this report are also included in this chapter.

Chapter III, *Market Analysis*, analyzes the forces, including technology, that are driving and inhibiting the use of information services. Totals for the use of information services by delivery mode and vertical market are presented with an analysis of the reasons for using information services vendors. Problems encountered with vendors are also explored.

Data is also presented in Chapter III from a selected group of interviews where the use of information services may increase substantially. This data provides further insight into the market and a point of reference for analysis of information services use.

Chapter IV, *Information Services Use in Market Sectors*, is devoted to an analysis of the business forces, technological directions, and expenditures for information services in each of the vertical markets highlighted in this year's report. A comparison of user ratings for vendors active in each market sector is also carried out.

In Chapter V, *Information Services Market*, an analysis of expenditures for each delivery mode and submode is carried out. The forces driving the use of the delivery mode and factors inhibiting use are discussed, and a breakdown of user expenditures by submodes and comparisons of the use of delivery modes in different market sectors are provided.

Appendix A reviews definitions of terms used in this report and Appendix B summarizes information on the user respondents contacted to prepare this report.

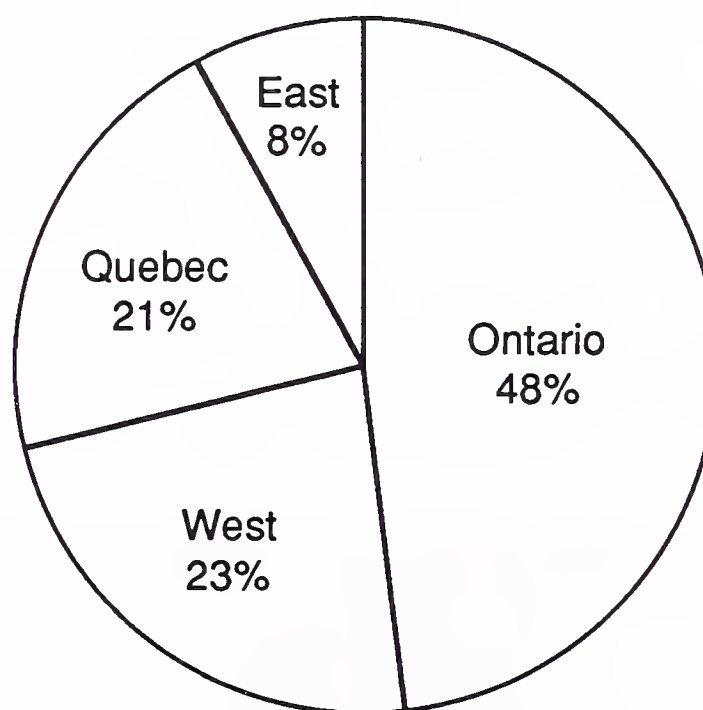
Appendix C, which contains the forecast data base, presents a detailed forecast for the Canadian market by information services delivery mode and selected submodes, together with a reconciliation to the preceding forecast.

B**Methodology****1. Expanded User Data Gathering**

Extensive primary research was carried out for this report. One hundred and sixty-nine interviews were conducted with Canadian users of information services.

- The geographic location of the user respondents is shown in Exhibit I-1. The number of interviews in each region is related to the relative amount of information services business in the region. More interviews were held in Ontario than in other areas because Ontario accounts for more information services expenditures than other areas.

EXHIBIT I-1

Geographic Location of User Respondents*

*Federal respondents not separated.

- The percentage of interviews by vertical market is shown in Exhibit I-2. This exhibit illustrates that sufficient information was collected about manufacturing to examine differences in the use of information services between process and discrete manufacturing.

EXHIBIT I-2

Percentage of User Respondents by Market Sector

Vertical Market	Percentage
• Manufacturing	26
- Process	17
- Discrete	9
• Finance and Banking	15
• Insurance	13
• Wholesale Distribution	12
• Utilities	7
• Business Services	6
• Retail Distribution	4
• Other, including Federal Government	17

Secondary research and interviews with 12 vendors (multiple interviews in some cases) were also conducted in support of the study.

2. Market Assumptions

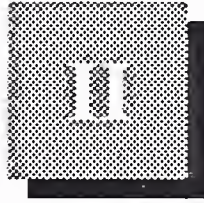
Information on economic and financial conditions was obtained from Canadian sources and factored into the analysis conducted in this report. In particular, a GDP deflator was utilized in developing the forecasts in this report. The market assumptions were reviewed with selected vendors in the Canadian market.

C

Related Reports

Other reports from INPUT that could be of interest in relation to this report include:

- *Worldwide Information Services Forecast, 1992-1997*
- *European Information Services Industry Analysis and Forecast, 1993-1998*
- *U.S. Information Services Industry Forecast Report, 1993-1998*



Executive Overview

A

Environment for Information Services

1. Business Environment

The general factors that information services users report as important in their business environment, which are shown in Exhibit II-1, have encouraged the use of information services in general.

- The continuing impact of the recession, the likelihood of NAFTA and increasing tax burdens have stimulated users to pursue programs to reduce costs and increase productivity.
- Initial signs of recovery in terms of improving trade have led companies to improve systems that support manufacturing, distribution and customer service.

The beginning of a recovery seems more likely in mid-1993 than it did in 1992. The IMF expects a growth rate of about 3% in Canada during the next two years, and several Canadian sources agree with this estimate.

- NAFTA appears to be a more positive factor than it did in mid-1992. Trade to the U.S. has picked up due to the change in value of the Canadian dollar, changes in the calculation of the sales tax in Canada (GST), and improving productivity in manufacturing.
- The likelihood of increasing taxes in the U.S. is also expected to aid Canadian trade by raising U.S. prices.

The impact of new information technology is having a significant impact on the Canadian business environment as well, as indicated in Exhibit II-1.

EXHIBIT II-1

Business Environment

Factor	Relative Importance*
Continuing Impact of Recession	4.1
Initial Signs of Recovery	3.8
Impact of NAFTA	3.7
Need to Increase Productivity	3.6
Federal Budget and Taxes	3.6
Impact of New Information Technology	3.5
Limitations in Funding Automation	3.3

*Rating: 5 = high and 1 = low.

- Users are increasing use of information services as a means of lowering costs, improving productivity and improving business functions.
- Users also report a high level of interest in extending the use of information technology to more corporate functions and offices through the use of new technology. Users are investing in new networks and client/server technology to better connect and integrate business activities.

2. Forces Driving Use of Information Technology

Many of the factors noted in regard to the business environment in Canada differ in importance between market sectors, as shown in Exhibit II-2.

- The need to react to the beginning of a recovery and continue to improve productivity is important in manufacturing, particularly in view of the impending start date for NAFTA. Discrete manufacturers have made substantial steps in reducing their disadvantage in productivity versus U.S. firms, and process manufacturers are following that example.
- Finance and insurance users have been concentrating more on reducing costs, but both sectors report the need to upgrade the use of IT as a business consideration.
- Wholesale and federal users also highlight their need to automate further. The desire to cut costs and the need to improve service are more prevalent this year than last.

EXHIBIT II-2

Factors Affecting Key Market Sectors

Industry	Selected Factors
Manufacturing	<ul style="list-style-type: none"> • Beginning of recovery • Impact of NAFTA • Need for increased productivity • Tax burden
Banking/Finance and Insurance	<ul style="list-style-type: none"> • Lending problems and opportunities • Uncertain economic condition • Pressure to cut costs • Need to upgrade IT • Tax burden
Wholesale Distribution	<ul style="list-style-type: none"> • Pressure to cut costs • Need for service improvement • Need to expand use of IT • Tax burden
Federal Government	<ul style="list-style-type: none"> • Very tight budgets • Need for more automation
Other	<ul style="list-style-type: none"> • Beginning of recovery • Continuing economic problems • Need for improved business systems and networks • Funding limitations • Tax burden

Other market sectors, including utilities, business services, retail distribution and communications, all show an interest in reducing costs and improving their business capabilities through greater or upgraded use of information technology.

3. Impact on Information Technology Budgets

In view of the actions to reduce costs, improve productivity and service and upgrade business functions through the use of IT, it is not surprising that user respondents forecast a meaningful increase in IT budgets in 1993, as indicated in Exhibit II-3.

- The average forecast of growth for all user respondents is slightly lower for the largest respondents. This is due to the fact that larger firms are much more automated and would be more likely to exhibit a smaller change on a percentage basis.
- The respondents were less sure of the level of increase of the IT budget over a period of five years, although most felt a definite near-term need, through 1993 and 1994, to increase expenditures for IT. This is chiefly due to the fact that many users expect near-term expenditures for down-sizing or outsourcing work to lead to reductions in budgets over a period of five years.

EXHIBIT II-3

Growth Forecast in IT Budget in 1993

Forecast	Increase 1993 vs. 1992 (Percent)
Average Growth Forecast by Respondents	8.0
Average Growth Forecast by Largest 25 Organizations > \$1 Billion Canadian in Annual Revenues	7.1

As Exhibit II-4 illustrates, the forecast of IT budget growth in 1993 is highest in Ontario, which corresponds with the findings reported in the *Financial Times* in May, 1993, that Ontario will lead the country through expansion in exports.

- Quebec is expected to participate in growth through export expansion as well, which is reflected in the fact that users reported the second highest level of IT budget growth in Quebec. Western Canada is not far behind Quebec in the forecast of IT growth. It has been the leading area for economic growth in Canada in the recent past, based on development in the energy and mining sectors.

- Eastern or Atlantic Canada, where users were less likely to forecast growth in budgets for IT, is expected to lag in growth, according to the Conference Board.

EXHIBIT II-4

Forecast IT Budget Growth in 1993 by Region

Region	Percentage
Ontario	7.1
Quebec	5.0
West	4.2
East	2.7

An analysis of the forecast of IT budget growth by market sector, summarized in Exhibit II-5, reveals that the highest level of growth is forecast in manufacturing, where business recovery is being felt most.

- Business services is forecasting a high rate of growth for IT budgets as well, because business in general is calling on these services as a means of improving functions and reducing costs, and is outsourcing functions.
- Finance and banking, insurance and wholesale distribution all forecast a moderate level of growth of IT budgets, but large enough to support substantial growth of information services expenditures.

EXHIBIT II-5

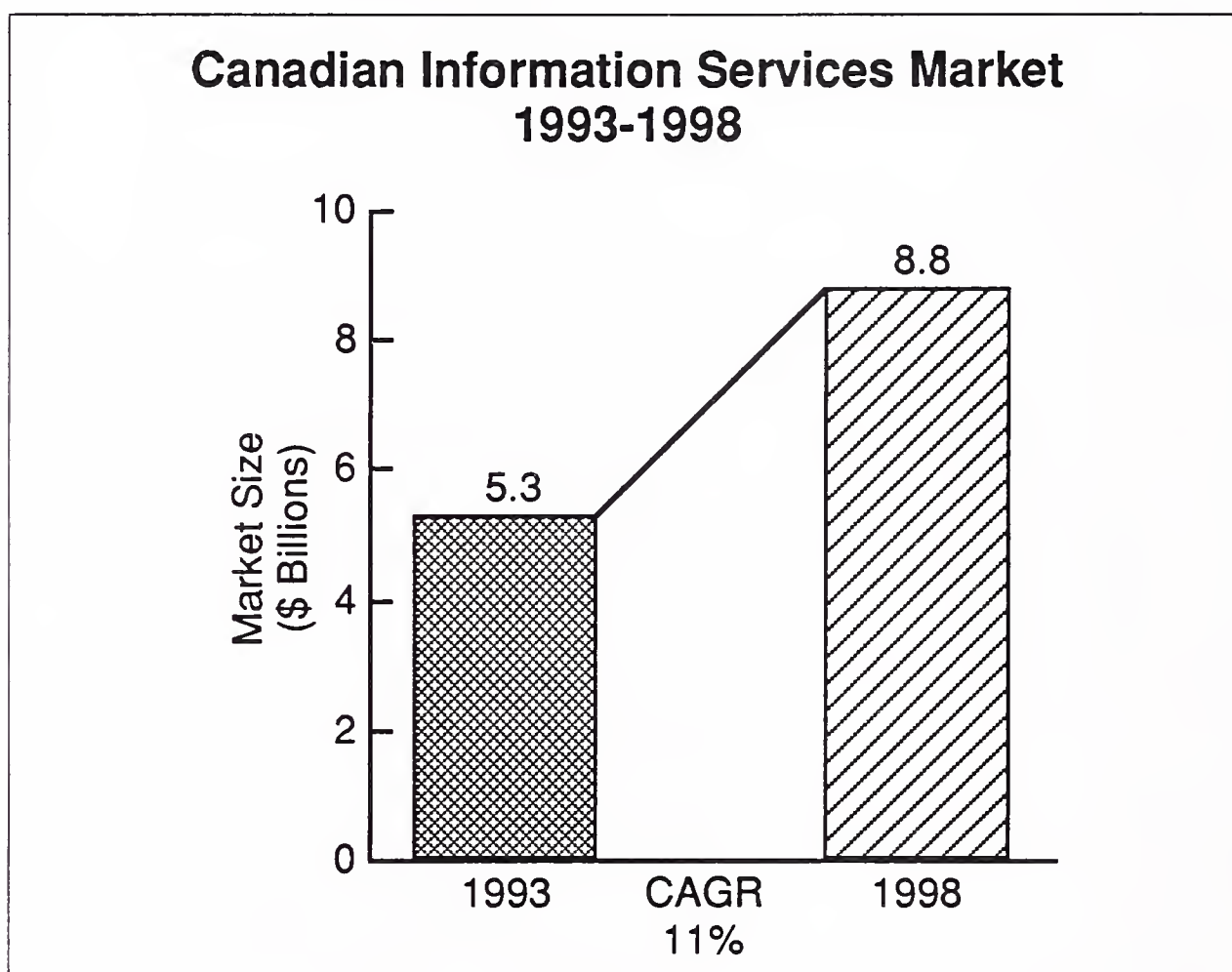
Forecast IT Budget Growth in Key Market Sectors

Market Sector	Growth in 1993 (Percent)
Manufacturing	16
Business Services	15
Finance and Banking	6
Wholesale Distribution	6
Insurance	5
Utilities	5
Retail Distribution	4

B**Information Services Market, 1993-1998**

The information services market will increase its rate of growth slightly over the next five years, driven by increases in trade and general recovery in the economy. As illustrated in Exhibit II-6, this will lead to a compound annual growth rate (CAGR) of 11% between 1993 and 1998, while expenditures increase from \$5.3 billion to \$8.8 billion Canadian.

EXHIBIT II-6



- Most of these expenditures will be made in Ontario, as indicated in Exhibit II-7.
- If expenditures for federal government offices and projects are counted separately, the division of expenses would be as shown in Exhibit II-8. Expenditures of the federal government are only outranked by those of Ontario.

EXHIBIT II-7

Division of Information Services Expenditures by Geographic Area, 1993

Area	Percentage of Total Expenditures
Ontario	66
Quebec	15
West	18
East	1

EXHIBIT II-8

Geographic versus Federal Share of Expenditures, 1993

Category	Market Share (Percent)
Ontario	56
Quebec	12
West	15
East	1
Federal Government	16

The use of information services by respondents, which is shown by delivery mode in Exhibit II-9, indicates that professional services and applications software products are the most frequently used modes.

- Systems software products and network services rank third and fourth in frequency of usage.
- Although they are not as frequently acquired, systems integration and operations involve more expenditures per contract, on the average.

EXHIBIT II-9

Respondent Use of Information Services

Delivery Mode	Percent of Respondents Using Mode, 1993
Processing	25
Turnkey	22
Applications Software	63
Systems Operations	22
Systems Integration	28
Professional Services	65
Network Services	50
Systems Software	56

Systems integration and operations follow professional services and applications software products in a measurement of the projected increase in expenditures forecast for 1993 to 1998, as shown in Exhibit II-10.

- Professional services and applications software are the largest modes of information services in dollar volume in 1993 and are forecast to be the largest modes in 1998.
- Since its growth rate is highest for delivery modes between 1993 and 1998, systems operations has been recognized as a significant opportunity in the Canadian market. Its growth rate is the result of plans to outsource information systems, as well as plans to have knowledgeable vendors implement major systems such as MRP in manufacturing and material management in the utility market.

EXHIBIT II-10

Largest Gains in Information Services Delivery Modes, 1993-1998

Delivery Mode	CAGR 1993-1998 (Percent)	Projected Increase in User Expenditures 1993-1998 (\$ Millions)
Professional Services	10	900
Applications Software Products	12	608
Systems Integration	10	536
Systems Operations	20	516

EXHIBIT II-11

Significant Gains in Information Services Expenditures

Market Sector	Growth 1993-1998 (\$ Millions)	CAGR 1993-1998 (Percent)
Banking and Finance	683	12
Discrete and Process Manufacturing	706	12
Insurance	172	10

An examination of increases in expenditures between 1993 and 1998 shows that banking and manufacturing offer significant opportunities in the Canadian market, as shown in Exhibit II-11. A review of key market sectors, shown in Exhibit II-12, indicates that manufacturing and banking/finance will have the largest shares of expenditures in 1993. These sectors also lead the other sectors shown with their 12% rate of growth between 1993 and 1998.

EXHIBIT II-12

Share of Information Services Expenditures by Key Market Sectors, 1993

Vertical Market	Share (Percent)
Manufacturing	17
Banking and Finance	16
Insurance	5
Wholesale Distribution	3
Federal Government	13
Utilities	2
Retail Distribution	2
Business Services	5

Although the federal government sector is third highest in expenditures in 1993, its growth rate of 3% between 1993 and 1998 is substantially below that of the other key segments. Insurance and business services, which rank fourth and fifth in shares of expenditures in 1993, have growth rates of 11% each.

C

Vendor Competition

The leading vendors of information services in the Canadian market listed in Exhibit II-13 tend to serve a number of market sectors and offer multiple delivery modes.

- Expenditures for IBM, DEC and SHL are reported by users in all market sectors indicated in Exhibit II-12. Users also report purchases of six or more delivery modes of services from these vendors.
- CGI, DMR and LGS were also reported as offering multiple information services to five or more markets.

EXHIBIT II-13

Market Shares of Leading Vendors of Information Services Canadian Market, 1992

Company	Market Share (Percent)*	Key Products/Services
Andersen	2-4	Professional services, SI
CGI	1-2	Professional services, SI, systems operations
DEC	4-6	Software products, SI, professional services, network services
DMR	1-2	Professional services, SI
EDS	1-2	Systems operations, professional services
IBM	over 10	Software products, professional services, SI, processing, SO
ISM	6-8	Processing, systems operations, professional services (subsidiary of IBM)
IST	1-2	Processing, turnkey systems, professional services
LGS	1-2	Professional services, software products
SHL	3-5	SI, systems operations, professional services

* Noncaptive information services

The total number of vendors mentioned by user respondents in relation to information services assignments amounted to 18, as shown in Exhibit II-14. The figures do not allow for instances in which users would not discuss vendors for various reasons such as a desire to maintain confidentiality about projects or competitive capabilities that were under development.

EXHIBIT II-14

Vendor Recognition by User Respondents

Vendor	Percentage of Users Who Rank Work of Vendor (Percent)
Andersen Consulting	15
CGI	15
Cognos	2
Computer Associates	2
Computer Task Group	2
Coopers & Lybrand	23
DEC	28
DMR	26
EDS	14
Ernst & Young	28
IBM	47
LGS	30
Microsoft	3
Oracle	2
Price Waterhouse	3
SAS	2
SHL	28
Unisys	3

Vendors were rated at different levels for strategic consulting, systems building and technical consulting capabilities.

- The average rating for strategic consulting was highest for Andersen Consulting, as shown in Exhibit II-15.
- IBM and DMR followed closely in ranking for strategic consulting. This type of service dealt with planning for projects (including re-engineering, according to some users), designing systems, and selecting the information technology to be used.

EXHIBIT II-15

User Rating of Vendors by Strategic Consulting Capabilities

Vendor	Rating of Strategic Consulting*
Andersen Consulting	3.7
CGI	3.2
Coopers & Lybrand	3.2
DEC	3.3
DMR	3.5
EDS	3.1
Ernst & Young	3.3
IBM	3.5
LGS	3.2
SHL	3.4

*Rating: 5 = high, 1 = low.

Exhibit II-16 indicates that SHL led in the average ranking for systems building, followed closely by DEC and IBM.

EXHIBIT II-16

User Rating of Vendors by Systems Building Capabilities

Vendor	Rating of Systems Building*
Andersen Consulting	3.4
CGI	3.3
Coopers & Lybrand	3.2
DEC	3.5
DMR	3.3
EDS	2.9
Ernst & Young	3.2
IBM	3.5
LGS	3.4
SHL	3.6

*Rating: 5 = high, 1 = low.

CGI and SHL tied for the lead in the ranking for technical consulting, as Exhibit II-17 illustrates. This work is generally associated with supplying personnel with high levels of technical skills for professional services or SI assignments or to aid in the use of processing, systems operations or other services.

EXHIBIT II-17

User Rating of Vendors by Technical Consulting Capabilities

Vendor	Rating of Technical Consulting*
Andersen Consulting	3.4
CGI	3.6
Coopers & Lybrand	3.5
DEC	3.4
DMR	3.5
EDS	3.2
Ernst & Young	3.4
IBM	3.3
LGS	3.5
SHL	3.6

*Rating: 5 = high, 1 = low.

D

Conclusions and Recommendations

1. Conclusions

One key conclusion of this study is that economic problems—including a high rate of unemployment and slow growth in GDP—worry a number of users, as indicated in Exhibit II-18. However, this exhibit also points out that there are a number of factors in the marketplace that will encourage increased use of information services.

- The desire for cost reduction, meeting competition, increasing international trade, and participating in the early stages of recovery can all lead to more expenditures for information services.

- User interest in downsizing business functions and finding less expensive means of extending the use of IT to additional offices and functions will also increase use of information services.

EXHIBIT II-18

Key Conclusions and Recommendations

- **Conclusions**
 - Continuing economic problems worry users
 - Initial stages of recovery encourage IT expenditures
 - NAFTA and competition impact IT plans
 - Cost reduction remains a major factor
 - Interest is high in downsizing and use of client/server technology
 - Financing problems can limit projects
- **Recommendations**
 - Analyze differences in opportunities by market sector
 - Anticipate demand for client/server technology
 - Anticipate movement of customers to client/server alternatives
 - Explore outsourcing opportunities

Financing problems can limit expenditures for information services, however, and users may be forced to pursue cost savings goals before other objectives can be addressed.

2. Recommendations

Among market sectors and individual companies, there can be significant differences of opinion about the use of information services.

- Some firms may voice interest in cost savings but be much more dedicated to improvements in customer services and productivity.
- Other firms report that they are interested chiefly in rebuilding a system, but expect to achieve cost savings in the near term.

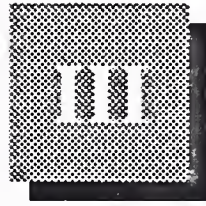
Vendors should spend time analyzing opportunities before preparing proposals for prospects.

Based on data from respondents, vendors should have a strategy for implementing and supporting the use of client/server technology because interest in it is so widespread.

- Users recognize the need for education and training as well as software product expertise to support client/server use.
- Users are also interested in new approaches to applications that involve client/servers even when they do not mention it to specific vendors.

Several users mentioned that they were interested in new application products in distribution, material management and banking, but had not mentioned these to vendors they were involved with because they were discussing mainframe and minicomputer products with these vendors. Vendors must bring those interests to the surface or they may lose sales.

Opportunities involving outsourcing should also be investigated because there are definite plans to use this mode and such plans involve long-term commitments for sizable expenditures.



Market Analysis

A

Forces Driving Use of Information Services

1. Business Forces

The forces that user respondents felt were driving their use of information technology are ranked in Exhibit III-1.

- Cost reduction ranks first. Users are upgrading and installing new accounting and financial systems to analyze, control and cut costs in all market sectors.
- Although cost reduction is of interest as a means of reacting to increases in taxes and business costs, users report that cost reduction is also being pursued to improve productivity and competitiveness.

EXHIBIT III-1

Forces Driving Use of Information Services

Forces Reported by Respondents	Relative Importance*
Cost Reduction	4.1
Response to Competition and NAFTA	3.7
Need for Improved Service	3.4
Need to Improve (or Re-engineer) Business Systems	3.3
Need to Use Newer Information Technology	3.3

*Rating: 5 = high, 1 = low.

Manufacturing users, particularly discrete manufacturers, have been active in reducing costs in order to overcome a disadvantage in productivity against U.S. manufacturers with whom they have been competing in transborder trade. This disadvantage has been largely overcome in many areas. Cost reduction has risen sharply in process manufacturing and other market sectors.

The pending agreement on NAFTA was an impetus for the initiation of efforts to improve productivity in manufacturing.

- NAFTA was expected by many Canadian corporations to have a negative impact throughout most of 1992.
- Exports to the U.S. have grown as a result of the revaluation of the Canadian dollar and changes in the GST, and will profit further from increasing taxes in the U.S., according to articles in the *Financial Times* during May 1993. These actions have made NAFTA look much more positive.

In order to profit from increasing trade, many Canadian manufacturers and distributors are planning to upgrade customer services, order entry and manufacturing through more intense use of IT. The pursuit of these improvements as well as the use of client/server technology have led to upgraded or re-engineered business functions.

The need to reduce costs or improve productivity is still paramount in many market sectors, including finance/banking, insurance and utilities, but it is now leading a number of users to make changes in business functions in order to achieve more effective use of resources. New client/server technology is also being reported as having influenced this development.

2. Trends in the Use of Information Technology

New technology is having a considerable impact on the use of information services in the Canadian environment, as pointed out in Exhibit III-1.

- Newer, client/server technology is seen as a means of lowering costs as well as improving business functions and competitiveness.
- Newer technology is also seen as a more effective means of redesigning or re-engineering business systems and as a lower cost means of extending the use of computing to more functions and offices of corporations.

Although business re-engineering was mentioned by only a small percentage of respondents as a market force (the majority spoke of redesigning or upgrading systems), interest in it is growing rapidly, particularly in large companies. It was included in the list of technology trends identified by user respondents as shown in Exhibit III-2.

EXHIBIT III-2

Key Technology Trends in the Canadian Market

Technology Reported	Relative Interest*
Client/Server Technology	3.6
Downsizing	3.4
Open Systems	3.3
Distributed Data Bases	3.1
EDI	2.7
New Network Technology	2.5
Re-engineering	2.1
Imaging	1.8

*Rating: 5 = high, 1 = low.

The leading trends in technology are concerned with the use of client/server technology.

- High levels of interest in downsizing and open systems are chiefly mentioned in relation to client/server use.
- Users report their interest in new banking, distribution, human resources, logistics and manufacturing systems that make use of client/servers.

Users, particularly in banking, also identified the use of distributed data bases as a trend related to the use of client/servers.

The uses of EDI and network technology also stand out as technological trends of significant interest, particularly in manufacturing and distribution. Plans to extend the use of EDI were being considered by many firms in these market sectors.

B**The Use of Information Services Vendors****1. Factors Involved in Using Information Services Vendors**

In addition to analyzing the business drivers and technological trends of interest in the Canadian market, the reasons that users report for using information services vendors rather than in-house resources should be considered. These are listed in Exhibit III-3.

- Although cost savings, technical and application knowledge are ranked high, the leading reason is more rapid implementation, which allows users to obtain business benefits more quickly.
- The need for technical knowledge to deal with new client/server technology, including graphical interfaces and object-oriented techniques of development, is recognized as a major need that vendors can help with, but the need for knowledge of business applications in which users are interested is also recognized as highly important and is reported to be the reason why some major contracts were awarded.

EXHIBIT III-3

Reasons for Using Information Services Vendors

Reason	Average Importance*
More Rapid Implementation	3.9
Cost Savings	3.7
Technical Knowledge	3.5
Application Knowledge	3.4
Lower In-house Staff Requirements	3.2

*Rating: 5 = high, 1 = low.

The need for rapid implementation of business goals must be kept in mind when recommending major changes in the use of technology, if that could delay business results. The ability to meet near-term business goals while engaging in a long-term effort to change technology will be more desirable in this marketplace.

Factors that can inhibit the use of vendors are indicated in Exhibit III-4.

- Vendors should anticipate that economic, financial or other corporate problems may have to be overcome to sell information services, but vendors should also note that a substantial number of users feel that no factor will inhibit use of these services.
- Vendors should also reflect on the fact that a lack of knowledge of the industry or applications of users can inhibit use more than can a lack of technical skills.
- The cost of information services can also be an inhibiting factor, although it is not as important as other factors.

EXHIBIT III-4

Factors Inhibiting Use of Vendors

Factor	Relative Importance*
Economic Conditions	4.2
Internal Problems or Corporate Reluctance	3.9
Financial Plans or Budgets	3.7
No Factors Will Inhibit Use	3.6
Lack of Vendor Knowledge of Industry or Applications	3.3
Lack of Technical Skills by Vendors	3.1
Cost of Information Services	3.0

*Rating: 5 = high, 1 = low.

2. Considerations in Vendor Selection

Cost does become an important factor in comparing and selecting vendors, as shown in Exhibit III-5.

To users, the effective price with discounts or other factors taken into consideration is only outranked by reputation or references about work done elsewhere. However, users report that decisions have been made in favor of vendors who had a large-scale approach for changing business or reducing costs who did not bid the lowest cost.

EXHIBIT III-5

Key Considerations in Vendor Selection

Consideration	Relative Importance*
Reputation	4.2
Price of Contract (Effective Price)	4.1
Technical Knowledge	3.8
Knowledge of Industry	3.8
Size of Vendor	3.3
Broad Range of Services	3.1

*Rating: 5 = high, 1 = low.

- Technical and industry knowledge rank closely behind cost and can be thought of as necessary conditions in addition to pricing and reputation for obtaining business.
- The size of the vendor and the range of services offered are much less important, but they can contribute to decisions on the use of vendors.

Vendors of information services in this market should also take into consideration the problems reported by users in relation to vendor contracts. As indicated in Exhibit III-6, 36% of users report such problems.

- Delays or late delivery is the leading problem, and it is a problem that users attempt to explore before considering a vendor.
- The imposition of extra charges or other pricing moves as well as a lack of application knowledge and poor quality also were mentioned by respondents.

Problems in communication or support ranked surprisingly high. Some vendors may need to investigate and improve their account management.

EXHIBIT III-6

Problems Encountered in Using Vendors

Percentage of Users Reporting Problems	36%
Problems Reported	Percentage of Users Reporting Problems
Delays or Late Delivery	10
Communication	7
Poor Support or Attitude	5
Pricing and Extra Charges	5
Lack of Application Knowledge	4
Lack of Quality	4

C**Forecasts of Expenditures for Information Services****1. Market Assumptions**

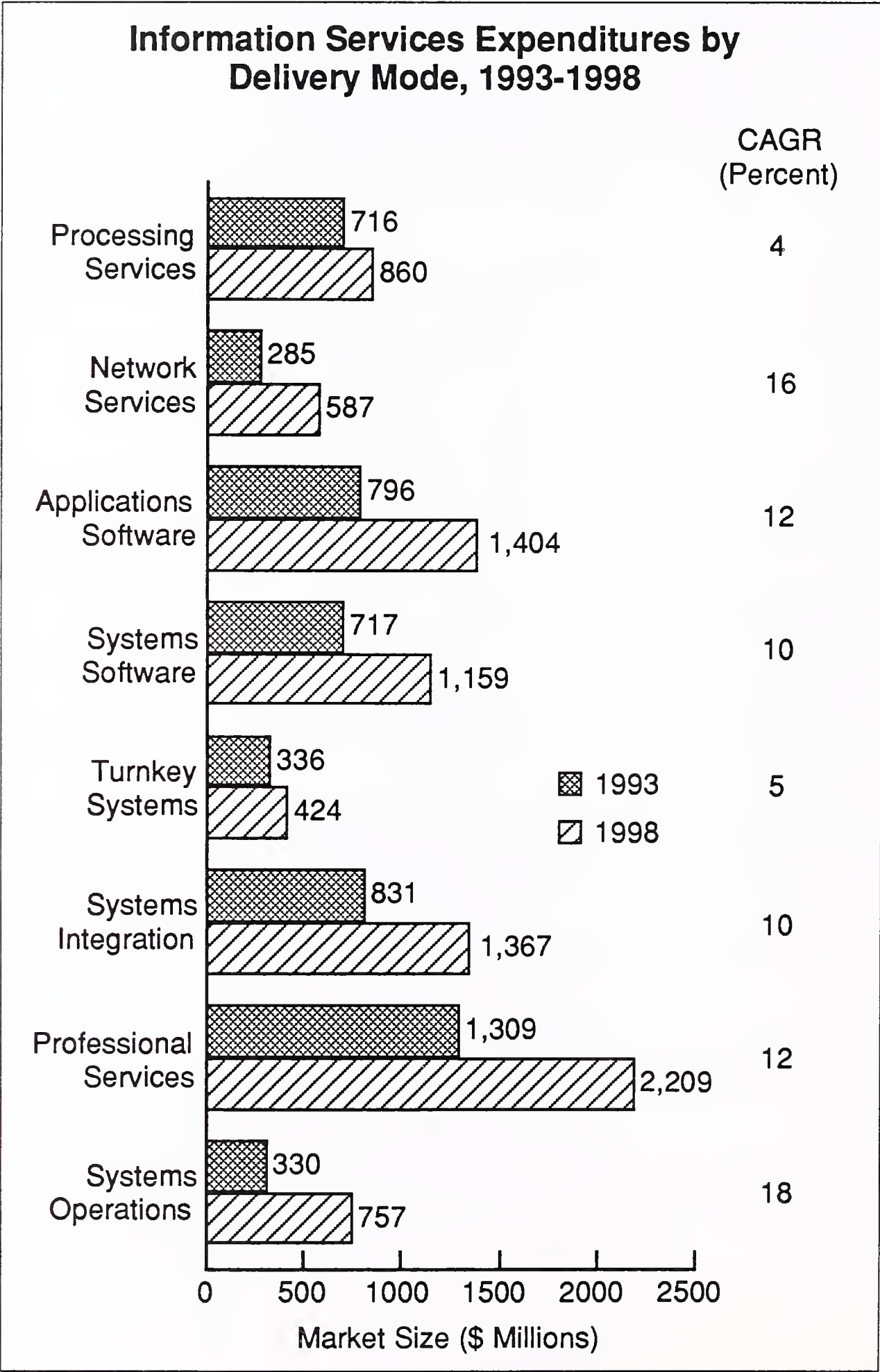
The assumptions about the Canadian market that have been used in developing forecasts of information services use in the Canadian market are that the GDP deflator will stay in a range of 3% to 4% in 1993 and 1994 and below 4.5% in 1995 through 1998. These assumptions are based on figures of the conference board reported in the *Financial Times* in May, 1993.

2. Forecast of Delivery Modes

User expenditures in each delivery mode, shown in Exhibit III-7, indicate that professional services and applications software products will continue to be the leading delivery modes in use through 1998.

- Systems operations and network services, driven by the use of EDI, are the fastest growing modes reported by users.
- Processing services and turnkey systems are the slowest growing modes, although both will continue to expand business through the end of the planning period.

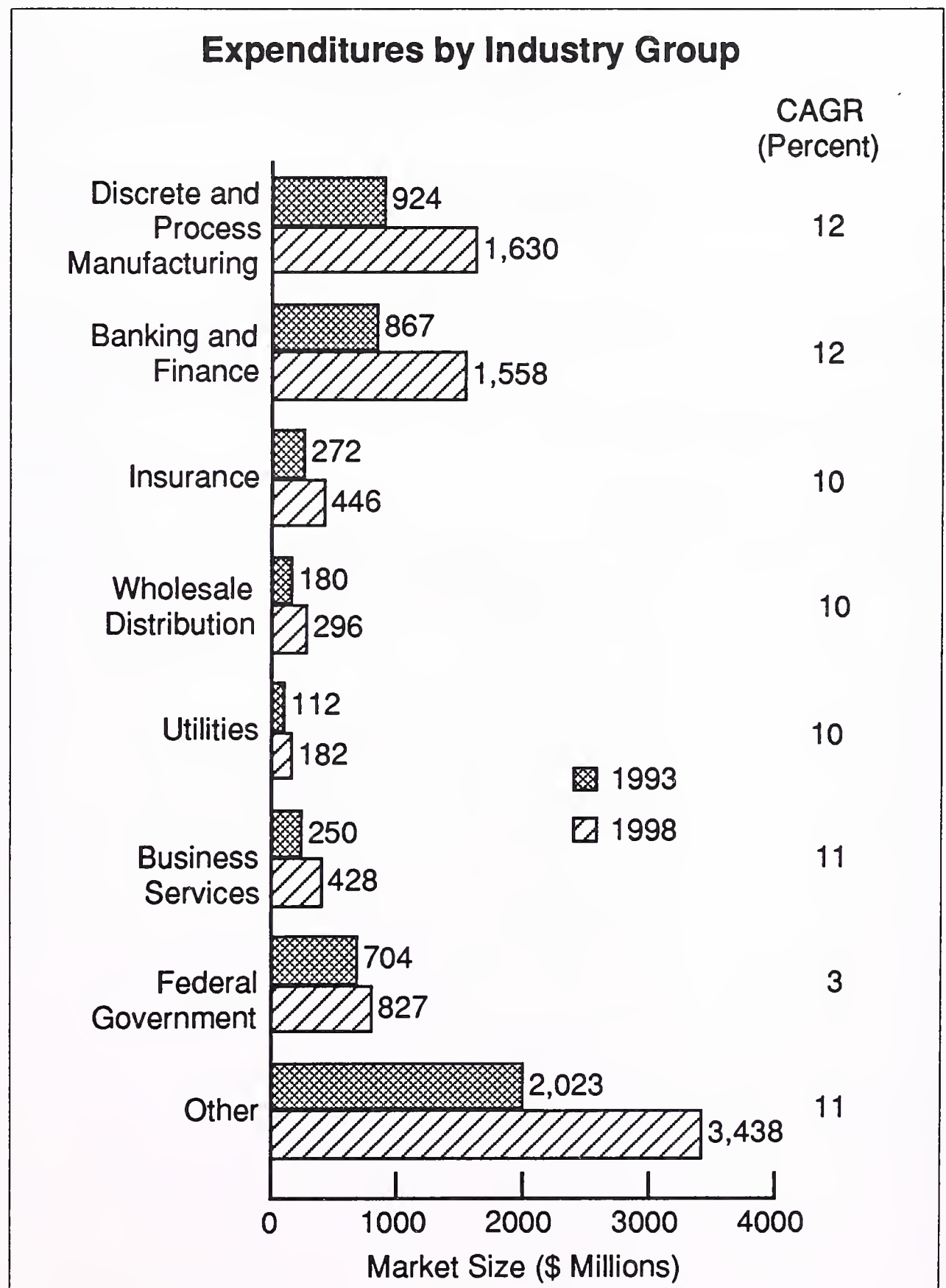
EXHIBIT III-7



The substantial growth in the use of applications and systems software products by 1998 will be fueled by the growth in use of workstation software products, which are growing over twice as fast as products for other platforms. Professional services and SI project work for workstation platforms is also growing much faster than work for other platforms.

User expenditures by market sector are shown in Exhibit III-8, illustrating that the two largest sectors, manufacturing and finance/banking, are also growing faster than the other sectors being monitored.

EXHIBIT III-8



- Business services is growing at about the same rate as the information services industry as a whole, and utilities and wholesale distribution are growing at rates just below that of the industry (10% versus 11%).
- Other sectors that would display moderate growth but are not shown in this exhibit because they were not analyzed to the same extent include communications, retail distribution and provincial/local government.
- Although it does not display rapid growth, the federal segment is of interest to vendors in view of its size.

Two sectors, utilities and business services, were added to those tracked, last year, in view of the interest of subscribers. At least, communications will be added to the sectors tracked in next year's report.

A comparison of the growth of information services delivery modes in Canada (1993-1998) versus the U.S. (1992-1997) is shown in Exhibit III-9.

EXHIBIT III-9

Information Services Growth in Canada versus the U.S.

Delivery Mode	CAGR in Canada, 1993-1998 (Percent)	CAGR in U.S., 1992-1997 (Percent)
Processing	2	8
Network Services	16	17
Applications Software Products	12	14
Systems Software Products	10	14
Turnkey Systems	5	8
Systems Integration	10	16
Systems Operations	21	17
Professional Services	11	10

- Systems integration is growing less rapidly in Canada, possibly because users are more inclined to use professional services and/or systems operations in Canada to meet their needs. Also, systems integration work that is done as part of systems operations or professional services assignments may be lumped together and not reported separately.

- The growth of processing, turnkey systems and systems software is also noticeably below rates for the same products in the U.S. The movement of some processing and turnkey systems work to systems operations may explain part of that difference.

3. Forecast by Market Sector

A comparison of growth rates in market sectors between Canada and the U.S. is shown in Exhibit III-10. Except for the federal government, these growth rates are not too different.

- For the market sectors with the highest growth rates in Canada—manufacturing and finance—the growth rates are the same as those in the U.S..
- The slightly higher growth rate for information services as a whole in the U.S. is reflected in rates for most other sectors.

EXHIBIT III-10

Growth in Selected Industries in Canada versus the U.S.

Industry Market	Information Services (Percent)	
	Canada, 1993-1998	U.S., 1992-1997
Discrete and Process Manufacturing	12	12
Banking and Finance	12	12
Insurance	10	11
Wholesale Distribution	11	13
Federal Government	3	10
Utilities	10	12
Business Services	11	10
Retail Distribution	11	14
Other	11	13
Total	11	12

Companies that are reporting high rates of growth for the use of information services are shown in Exhibit III-11.

- Many of the companies shown in the exhibit mention financial and accounting applications due to the importance given to cost reductions and control.
- A variety of other applications is also mentioned, including merchandising, payroll, inventory and trust.

EXHIBIT III-11

Examples of Rapid Growth in Use of Services

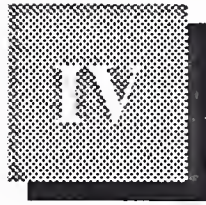
Region	Industry	Plans	Applications
East	Utility	SI up by 60%, software up by 40%	Material management
East	Communications	SI and network services will each rise 100%	Financial, inventory
Ontario	Wholesale Distribution	Increase use of applications and systems software by 50%	Order entry, financial, warehouse management
Ontario	Process Manufacturing	IT budget going up by 500% for all services, including SO	Performance management
Ontario	Wholesale Distribution	Use of information services to double for software, turnkey, professional services, and SO	Merchandising, inventory, financial
Ontario	Process Manufacturing	IT budget going up 250% to buy software	MRP and financial
Ontario	Wholesale Distribution	Use of SO will double	EDI and financial transaction process
Ontario	Discrete Manufacturing	SO will increase by 50%	Accounting and sales
Ontario	Discrete Manufacturing	Use of turnkeys will increase 50% to 70%	Financial and distribution
Ontario	Miscellaneous	Applications and systems software both to go up by 100%	Personnel and payroll
Ontario	Medical	SI to increase by 65%	Accounting and property management
Ontario	Retail Distribution	Software expenditures to increase by 50%	Merchandising and financial
Ontario	Wholesale Distribution	Software expenditures to increase by 100%	Service to users
Ontario	Finance	Software expenditures to increase by 200%	ATM network
Ontario	Insurance	SI and professional services to increase by 150% each	Accounting and data base upgrade

Continued

EXHIBIT III-11 (CONT.)

Examples of Rapid Growth in Use of Services

Region	Industry	Plans	Applications
Ontario	Communications	Professional services to increase by 70%	Bill processing
Ontario	Finance	Applications software up by 200%, SI by 100%	Retail banking
Ontario	Finance	Professional services and applications software up by 120%	Trading system
Ontario	Federal Government	SI, SO, network services, software up 20% to 100%	Financial
Ontario	Process Manufacturing	Applications software up 100%, SO up 90%	Financial, inventory
Ontario	Finance	Processing, professional services, software all up 35% to 50%	Decision support systems and financial
Quebec	Communications	Professional services up by 125%	MIS reporting
Quebec	Retail Distribution	Professional services up 100%, software 200%	Accounting, inventory
Quebec	Finance	SO to increase by 1000%	Trust
West	Communications	SO up 115%	Operations
West	Provincial/Local	Increase use of processing services by 200%	Financial modeling
West	Process Manufacturing	Budget to double for turnkey, professional and network services, and outsourcing	Exploration, financial
West	Process Manufacturing	Outsourcing to increase by 50%	Accounting, purchasing
West	Process Manufacturing	Applications software up by 90%, professional services up by 25%	Inventory, sales, accounting
West	Utility	SO up by 115%	Material management



Information Services Use in Market Sectors

A

Manufacturing Market

1. Factors Affecting the Manufacturing Market

Factors that information services users in manufacturing report as important in their business environment are shown in Exhibit IV-1.

- Despite the mention of funding limitations and the increasing tax burden, the factors rated highest are the beginning or initial stages of a recovery and the need for increased productivity, both of which have encouraged and expanded use of IT.
- The need to respond to competition and to the impact of NAFTA as well as the need to improve IT use are also factors that are increasing use of IT.

EXHIBIT IV-1

Factors Affecting Manufacturing

Factor	Relative Importance to Users*
Beginning of Recovery	3.8
Need for Increased Productivity	3.6
Response to Competition and Free Trade	3.3
Funding Limitations	3.2
Tax Burden	3.2
Need to Improve IT Use	3.2

*Rating: 5 = high, 1 = low.

The technological directions of interest in manufacturing shown in Exhibits IV-2 and IV-3 differ somewhat between discrete and process manufacturing, but they both emphasize downsizing, open systems and the use of client/server technology. This emphasis suggests that vendors responding to the business drivers in manufacturing should be prepared to support client/server technology.

- The use of distributed data bases is also of interest in both submarkets of manufacturing, but is of more concern in discrete manufacturing, where complex data bases have generally been in use longer.
- Vendors should also note that both submarkets are also interested in EDI and the use of re-engineering. Opportunities to aid in the use of these technologies should be explored when contacts are made with manufacturers regarding jobs in other modes.

EXHIBIT IV-2

Technological Directions in Discrete Manufacturing

Technology	Relative Importance*
Distributed Data Bases	3.1
Client/Server Technology	3.1
Downsizing	2.8
Open Systems	2.8
Re-engineering	2.7
EDI	2.7
CASE	2.6
New Network Technology	2.6
Imaging	2.5

*Rating: 5 = high, 1 = low.

EXHIBIT IV-3

Technological Directions in Process Manufacturing

Technology	Relative Importance*
Downsizing	3.7
Open Systems	3.7
Client/Server Technology	3.5
Re-engineering	3.4
Distributed Data Bases	3.3
New Network Technology	2.9
EDI	2.7
CASE	2.7
Imaging	2.1

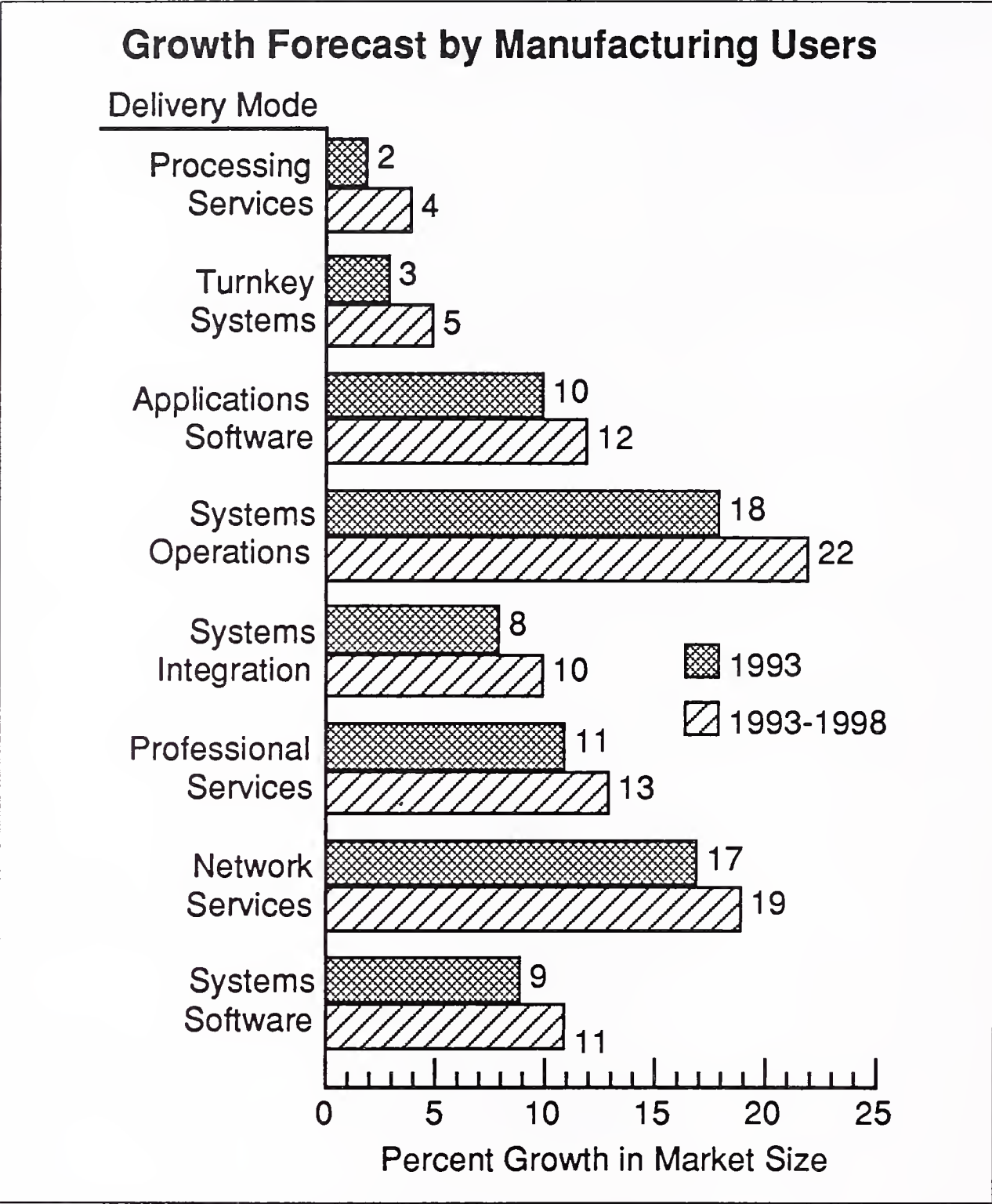
*Rating: 5 = high, 1 = low.

2. Growth of Information Services in Manufacturing, 1993-1998

The growth of expenditures for information services reported by users in Exhibit IV-4 shows that systems operations and network services will enjoy the highest growth rates in manufacturing between 1993 and 1998.

- Users forecast a higher rate of growth for both of these service modes for the period from 1993 to 1998 than they do in 1993 by itself. This suggests that users feel that the need to use these services will increase over the five-year period.
- Systems operations (SO) displays the greatest difference between the near-term growth rate and the rate for the next five years, indicating the potential for rapid growth of use between 1994 and 1998.

EXHIBIT IV-4



Five of the seven examples of high growth rates for user activities in manufacturing listed in Exhibit III-11 show high rates of growth for SO (or outsourcing) activities.

- Accounting and financial applications were mentioned most often for these manufacturing applications.
- Sales, inventory, purchasing, exploration and performance management (one of the highest growth rates) were also mentioned.

High rates of growth were also indicated for applications software products for two examples shown in Exhibit III-11. These manufacturers were both going to use software products for new inventory and other application systems.

3. Rating Vendors Serving Manufacturing

The vendors of information services ranked highest by manufacturing users differ somewhat between discrete and process manufacturing users, as shown in Exhibits IV-5a and IV-5b.

- Andersen Consulting leads in the rating of work by discrete users, but is not included in the rating of top firms in the process manufacturing market.
- Digital leads the rating of vendors for process users, and E&Y, LGS and DMR are included on that list although they do not appear on the list of highly rated vendors for discrete manufacturing.

There are differences between the discrete and process manufacturing markets regarding the use of vendors. Discrete users report a greater interest in planning and issues regarding data management than do process users, who report greater interest in technical assistance in generating solutions.

EXHIBIT IV-5A

Vendors of Information Services to Discrete Manufacturing Users

Vendor	Relative Rating of Work by Discrete Manufacturing Users*
Andersen Consulting	4.1
SHL	3.9
IBM	3.1
Digital	3.0

*Rating: 5 - high, 1 = low (ratings by 5 or more users).

EXHIBIT IV-5B

Vendors of Information Services to Process Manufacturing Users

Vendor	Relative Rating of Work by Process Manufacturing Users*
Digital	4.0
E & Y	3.9
SHL	3.6
DMR	3.3
LGS	3.3
IBM	3.2

*Rating: 5 - high, 1 = low (ratings by 6 or more users).

B

Finance/Banking Market

1. Factors Affecting the Finance/Banking Market

Factors that information services users in the finance and banking market report as important in their business environment in relation to the use of information services are shown in Exhibit IV-6.

- The factors that are reported to be of greatest importance relate to lending problems and the economic problems that have plagued Canada during the last few years.
- However, these problems are promoting greater use of information services. The need to deal with lending problems and evaluate lending opportunities as well as the desire to reduce costs and meet competitive challenges are leading to greater use of software products and other information services.

EXHIBIT IV-6

Factors Affecting Finance and Banking

Factor	Relative Importance*
Lending Problems and Opportunities	3.9
Continuing Economic Problems	3.8
Pressures to Cut Costs	3.6
Need to Upgrade IT Use	3.2
Tax Burden	3.1
Competition	3.1

*Rating: 5 = high, 1 = low.

Client/server technology was reported to be of growing interest to users as a means of monitoring commercial loans and other business and controlling costs because it can be used in functional areas of an organization.

- Expanding use of client/server technology is leading finance and banking institutions to consider rethinking and possibly consolidating present use of IT, as indicated in Exhibit IV-6.
- The desire to change IT use is also reflected in the technological directions of interest in finance/banking shown in Exhibit IV-7.

Users in this market are interested in the use of new technology and even more in the management of distributed data bases, which will be required to support the growth in use of client/server and other distributed technology.

EXHIBIT IV-7

Technological Directions in Finance and Banking

Technology	Relative Importance*
Distributed Data Bases	3.7
Client/Server	3.1
Open Systems	3.1
Downsizing	3.0
EDI	2.8
New Network Technology	2.7
CASE	2.6
Imaging	2.4
Re-engineering	2.4

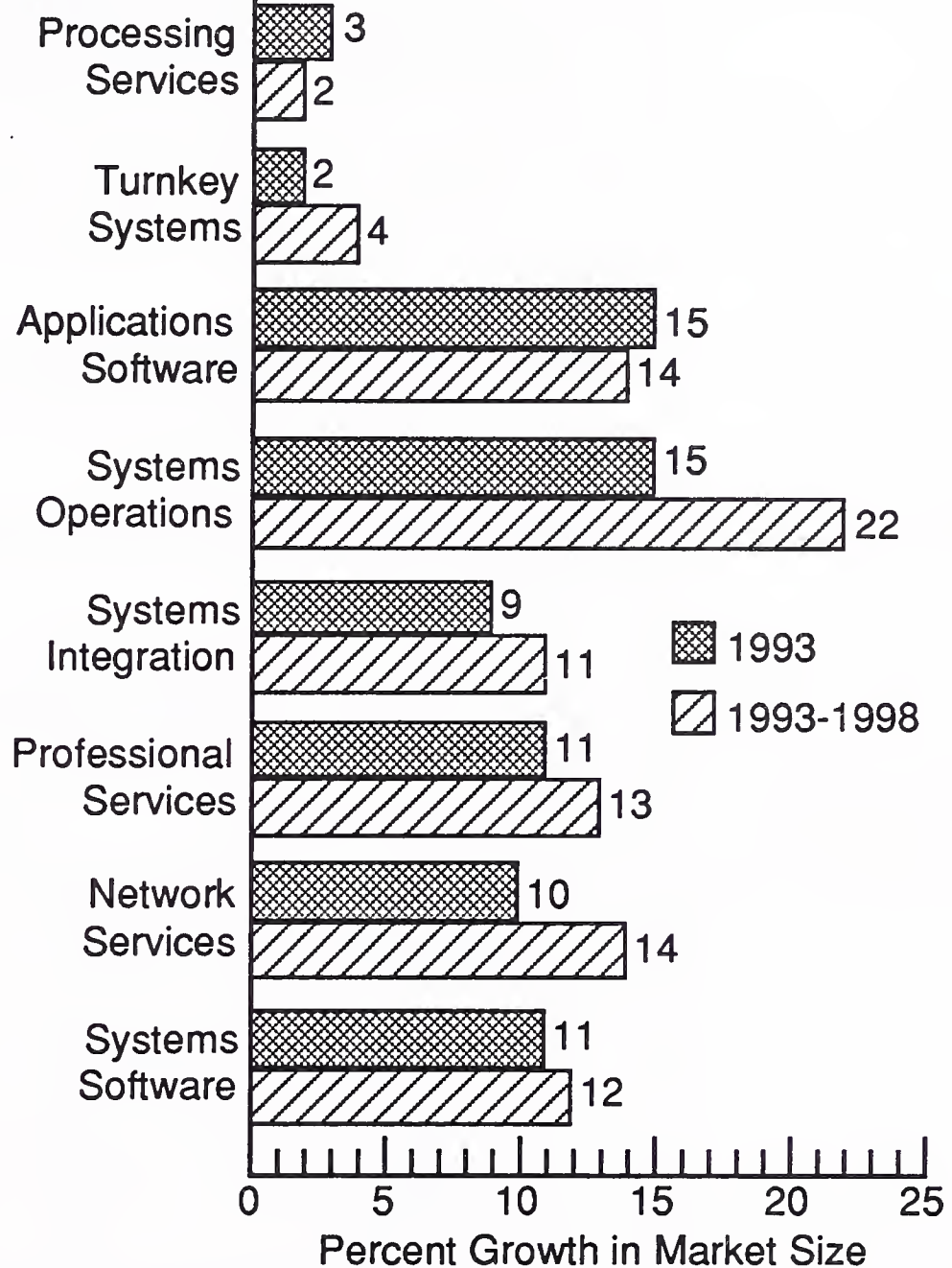
*Rating: 5 = high, 1 = low.

2. Growth of Information Services in Finance/Banking, 1993-1998

Plans for the use of information services to control business and costs and meet other objectives are reflected in the growth forecast for the use of information services shown in Exhibit IV-8.

- Expenditures for software products, professional services and systems integration and operations will grow at rates above those for the market as a whole over the next five years.
- The growth in expenditures is particularly high for software products for workstation platforms.
- Growth rates forecast for the five-year period by users are above the rates forecast for 1993 except for processing services and application software products (the growth rate for application software products remains high, however). Growth should pick up for other services when the economy improves.

EXHIBIT IV-8

Growth Forecast by Finance and Banking Users**Delivery Mode**

Significant increases in the use of information services for banking and finance firms are listed in the examples shown in Exhibit III-11.

- Increases in use of SI, SO, professional services and applications software products of 100%, 200% and more in a group of finance/banking users are being planned.
- These increases will be made to upgrade and expand a variety of applications, including ATM systems, trust, money market and retail systems.

3. Rating Vendors Serving Finance/Banking

Many of the vendors of information services ranked highest for their work by finance/banking users are also vendors who serve the manufacturing market, but their order of importance is shifted somewhat, with a different firm—Ernst & Young—in the leading position. Exhibit IV-9 shows this vendor ranking.

- Leading vendors of information services tend to address multiple market sectors.
- Vendors who have high recognition for information services in a market often have other business in the market, such as IT equipment or auditing.

The largest vendors in terms of current sales in banking/finance include IBM, Digital and SHL.

EXHIBIT IV-9

Vendors of Information Services to Finance and Banking Users

Vendor	Relative Rating of Work by Finance Users*
E & Y	4.0
DMR	3.8
SHL	3.6
IBM	3.3
Digital	3.2

*Rating: 5 - high, 1 = low (ratings by 5 or more users).

C**Insurance Market****1. Factors Affecting the Insurance Market**

The factors that information services users in the insurance market report as important in their business environment include pressures to cut costs and continuing economic problems, as shown in Exhibit IV-10.

- Needs to improve service and meet competition are recognized, but they are not reported to be as important in driving the use of information services as the need to cut costs.
- The need to cut costs as well as the desire to improve service and upgrade IT use are all contributing to decisions to increase use of information services.

EXHIBIT IV-10

Factors Affecting Insurance

Factor	Relative Importance*
Continuing Economic Problems	3.6
Pressure to Cut Costs	3.4
Need to Upgrade IT Use	3.1
Funding Limitations	3.0
Tax Burden	3.0
Need to Improve Service	2.8
Competition	2.7

*Rating: 5 = high, 1 = low.

The use of client/servers and downsizing dominates the technological directions of interest in the insurance market, as illustrated in Exhibit IV-11.

- The use of distributed data bases ranks nearly at the same level because this capability is important in the insurance market, particularly in planning the use of client/server technology.

- Other technologies, including network technology and the use of CASE, are ranked at a lower level of interest. Re-engineering business functions, which was ranked at the level of this second group, has just emerged as a subject of interest to users in this market.

EXHIBIT IV-11

Technological Directions in the Insurance Market

Factor	Relative Importance*
Client/Server Technology	3.6
Open Systems	3.3
Downsizing	3.2
Distributed Data Bases	3.1
CASE	2.3
New Network Technology	2.3
EDI	2.2
Re-engineering	2.2
Imaging	1.9

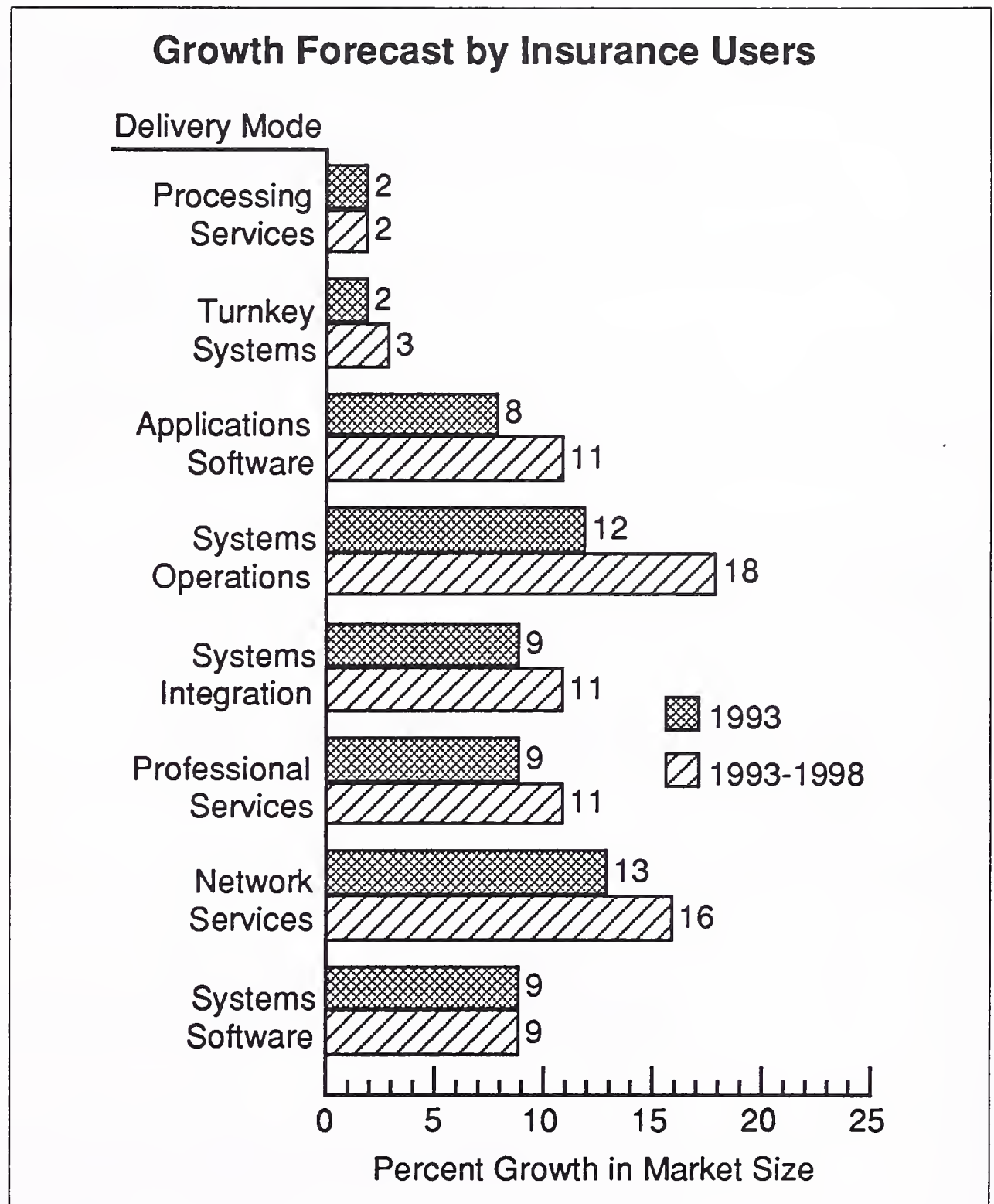
*Rating: 5 = high, 1 = low.

2. Growth of Information Services in Insurance, 1993-1998

The growth of information services expenditures for the insurance market, illustrated in Exhibit IV-12, shows that systems operations and network services will enjoy the highest growth rates between 1993 and 1998.

- Users predict a higher rate of growth for each of these service modes for the period from 1993 to 1998 than they do in 1993 by itself. This suggests that users feel that the need to use these services will increase over the five-year period.
- Network services displays the greatest difference between the near-term growth rate and the rate for the next five years because users foresee a jump in use of electronic information services (on-line data bases) and network applications such as EDI and electronic mail during the next five years.

EXHIBIT IV-12



Although the use of professional services, SI and SO are near or slightly above the average use of these modes in other sectors, the use of turnkey systems and applications software products is less.

- This may be due to the fact that insurance users plan to turn from these modes to SO, SI and professional services during this period.
- The example of significant increase of information services shown in Example III-11 for an insurance firm is concerned with a significant increase of SI and professional services for accounting and data management, but there was no mention of applications software products.

3. Rating Vendors Serving Insurance

The vendors of information services ranked highest by insurance users are led by IBM and Andersen Consulting, as shown in Exhibit IV-13. Most of the vendors rated by users are bunched quite closely together in the ratings.

EXHIBIT IV-13

Vendors of Information Services to Insurance Users

Vendor	Relative Rating of Work by Insurance Users*
Andersen Consulting	3.3
IBM	3.3
DMR	3.2
C & L	3.1
E & Y	3.1
Digital	3.0
LGS	2.9
SHL	2.9
EDS	2.8

*Rating: 5 - high, 1 = low (ratings by 6 or more users).

Several other vendors were mentioned by only a few users, and consequently were not included in Exhibit IV-13 because they were not rated by six or more users. PMS, for instance, was rated well by only one user, and CGI was rated highly by two of the four insurance users who have used its services.

The volume or market share of vendors can also make a difference in obtaining additional business, according to several users who mentioned using IBM and DMR because they are two of the leaders in market share.

D**Wholesale Distribution Market****1. Factors Affecting the Wholesale Distribution Market**

Factors that information services users in the wholesale distribution market report as important in their business environment are shown in Exhibit IV-14.

- On the average, the factors that are reported emphasize a positive business outlook that anticipates recovery and foresees a need to improve productivity, service and IT use. These factors are stimulating the use of IT and information services.
- The only negative factors that were mentioned were the tax burden and the amount of competition. The latter was also seen as a challenge that had to be met in the marketplace, which will encourage use of information services.

EXHIBIT IV-14

Factors Affecting Wholesale Distribution

Factor	Relative Importance*
Beginning of Recovery	3.8
Need for Increased Productivity	3.6
Need for Service Improvement	3.6
Competition	3.4
Tax Burden	3.2
Need to Expand IT Use	3.1

*Rating: 5 = high, 1 = low.

The development in the U.S. market—in which giant retailers such as Wal-Mart and Home Depot are bypassing independent wholesalers and dealing directly with manufacturers—is not reported to be as yet significant in the Canadian market.

In relation to the need to expand IT use noted in Exhibit IV-14, users noted a strong interest in client/server technology. This is reflected in the importance given to this technology in Exhibit IV-15.

- The foremost thought in relation to technological directions in wholesale distribution is downsizing application systems.
- The use of open systems and handling distributed data bases are also mentioned. Several users mentioned an interest in education and training and consulting aid from vendors in relation to these issues.
- The use of EDI was also mentioned as important. Users reported that EDI is expected in many business relationships today.

EXHIBIT IV-15

Technological Directions in Wholesale Distribution

Technology	Relative Importance*
Downsizing	4.5
Client/Server Technology	4.0
Open Systems	3.7
Distributed Data Bases	3.5
EDI	3.4
CASE	3.4
New Network Technology	3.2
Re-engineering	3.1
Imaging	2.5

*Rating: 5 = high, 1 = low.

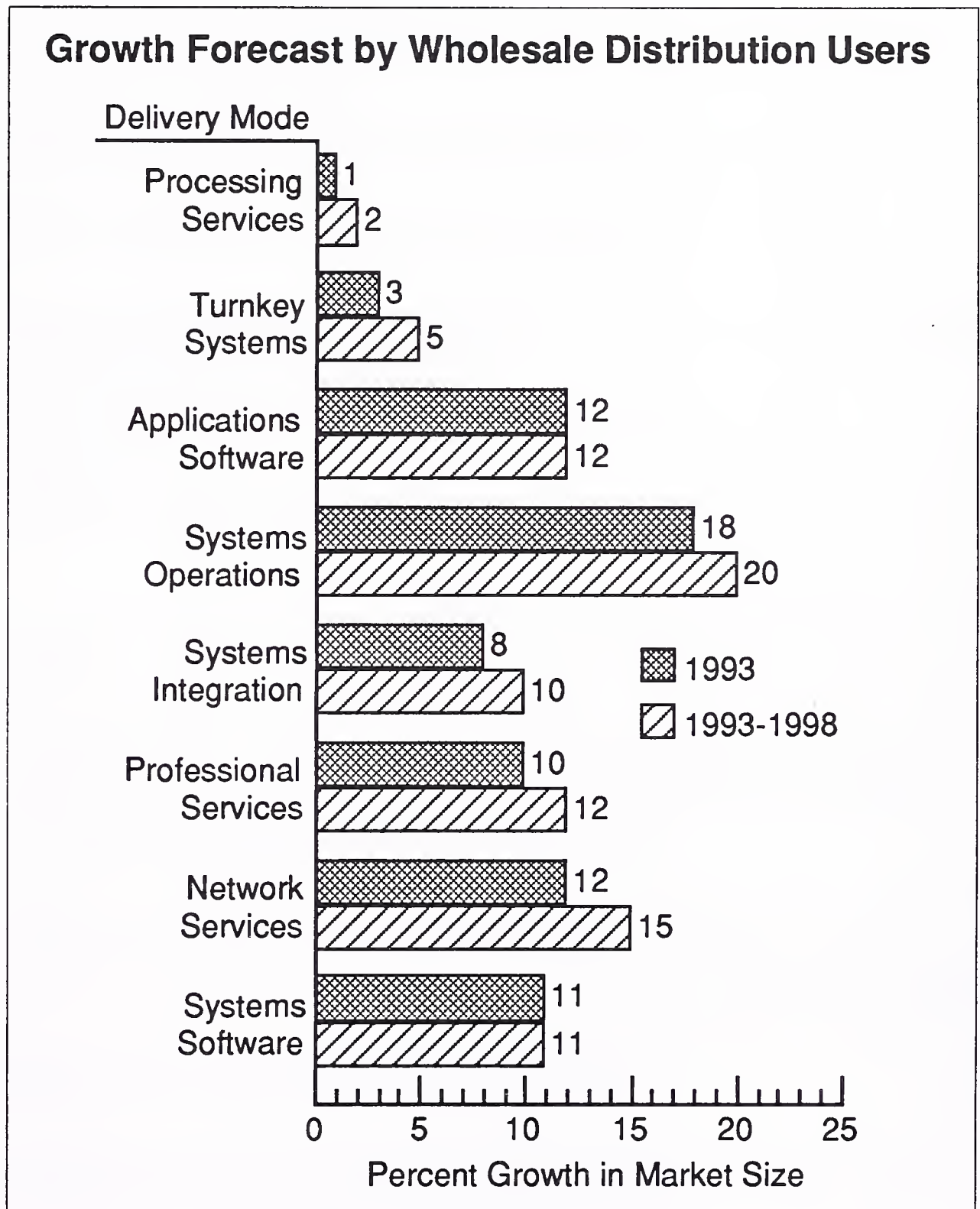
2. Growth of Information Services in Wholesale Distribution, 1993-1998

As indicated in Exhibit IV-16, expenditures for software products in total are expected to grow at rates above average over the next five years in wholesale distribution.

- The applications mentioned most often in relation to this growth were inventory and financial in nature, but several of the users also mentioned applications that would improve customer services, automate warehouse management and expand use of EDI. The examples of wholesale projects shown in Exhibit III-11 illustrate this.

- Expenditures for software products also reflect growth of downsizing and use of client/server technology.

EXHIBIT IV-16



The examples of user plans shown in Exhibit III-11 illustrate that use of SO is growing rapidly in the wholesale distribution market, although it is growing from a small base. Network services is also growing at a fast rate, driven by the growth in use of EDI.

3. Rating Vendors Serving Wholesale Distribution

The vendors of information services ranked highest for their work by wholesale users are led by SHL and IBM, as shown in Exhibit IV-17. IBM leads in market share in wholesale distribution.

- IBM and SHL are bunched closely together with DMR and Ernst & Young in terms of their evaluation as prospective suppliers.
- CGI and Coopers & Lybrand are also ranked highly by a few users, but are not recognized by five or more users.

EXHIBIT IV-17

Vendors of Information Services to Wholesale Distribution Users

Vendor	Relative Rating of Work by Wholesale Users*
SHL	4.2
IBM	4.2
DMR	4.1
E & Y	4.1
Digital	3.7

*Rating: 5 - high, 1 = low (ratings by 5 or more users).

E

Retail Distribution Market

1. Factors Affecting the Retail Distribution Market

There are two competing factors that information services users in the retail distribution market report as most important in their business environment, as shown in Exhibit IV-18.

- Although retailers feel that signs of a recovery are an important factor, they give equal weight to the need to reduce costs.
- The need to improve services and the impact of competition are also important factors.

EXHIBIT IV-18

Factors Affecting Retail Distribution

Factor	Relative Importance*
Beginning of Recovery	3.9
Pressure to Cut Costs	3.9
Need to Improve Services	3.8
Competition	3.6
Need to Upgrade Business Systems and Networks	3.6
Pressure to Upgrade Use of Technology (including EDI)	3.6

*Rating: 5 = high, 1 = low.

As a whole, market factors favor greater use of IT and information services.

- Needs to improve services to customers, upgrade business systems and networks, upgrade the use of IT and meet competition as well as to reduce costs are recognized by most retail users as reasons to increase expenditures for IT and information services.
- However, there is worry about the state of the economy and unemployment among some retailers that may make them reluctant to commit themselves to large expenditures.

There is also some conflict in the ranking of technology trends by retail users, as shown in Exhibit IV-19.

- On the average, there was not a high level of importance given to any technological trend. In fact, most trends were rated in the same narrow band.
- Interest is highest in downsizing, but the use of distributed data bases, re-engineering of business functions and the use of EDI are bunched together with the use of client/server technology. Respondents report that all these trends are important, but there is a challenge to decide what to do first.

EXHIBIT IV-19

Technological Directions in Retail Distribution

Technology	Relative Importance*
Downsizing	3.0
Distributed Data Bases	2.8
Open Systems	2.8
Re-engineering	2.8
EDI	2.6
Client/Server Technology	2.6
New Network Technology	2.4
CASE	2.3
Imaging	2.0

*Rating: 5 = high, 1 = low.

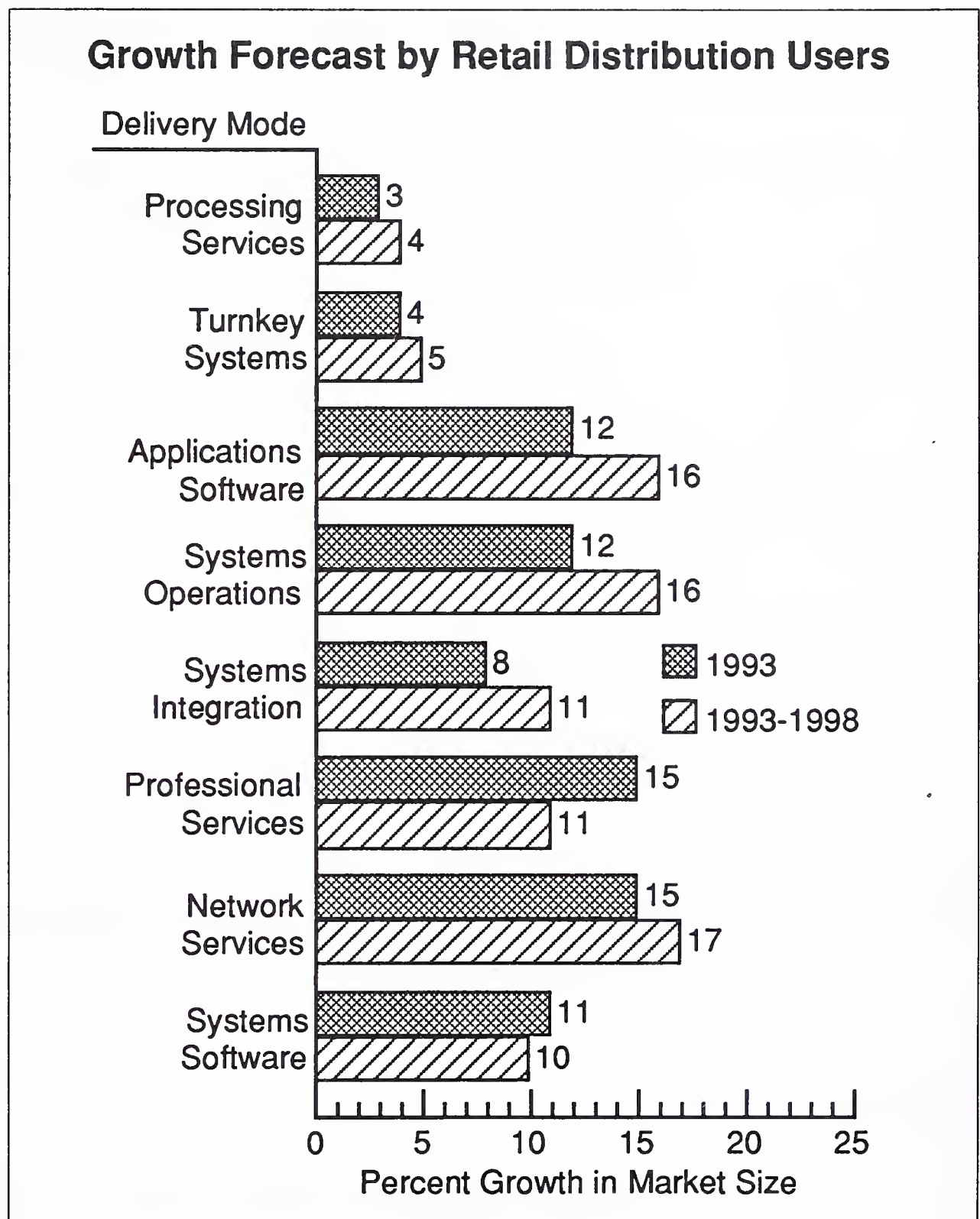
The situation on retail distribution may call for more consultative selling from information services vendors in order to help users plan steps to take in the use of IT.

2. Growth of Information Services in Retail Distribution, 1993-1998

Forecasts of the growth in use of information services by retail distribution users for the next five years that are provided in Exhibit IV-20 show some interesting changes during the next five years.

- Professional services are growing in use rapidly during 1993 to modify current applications—chiefly to meet cost savings objectives in inventory handling and merchandising and to improve accounting and financial reporting, according to users.
- The use of professional services will drop back to the average rate of growth for this mode over the five-year period and the use of applications software products will grow rapidly as users turn more to the use of client/server technology.

EXHIBIT IV-20



One of the examples of a retail user shown in Exhibit III-11 involved an increase in use of professional services in the near term, followed by increasing use of software products to support the use of new technology.

3. Rating Vendors Serving Retail Distribution

For the retail distribution marketplace, only a small number of users ranked vendors that provided them services, as shown in Exhibit IV-21. Coopers & Lybrand and CGI ranked highest among these vendors.

- Some users felt uncertain about the services that they were obtaining from other vendors because they were not certain about their plans for future use of IT.
- Users did state that they were most interested in vendors who had experience in retail application systems, including accounts payable, general ledger, inventory and merchandising. Knowledge of these applications and of EDI are important in retail distribution.

EXHIBIT IV-21

Vendors of Information Services to Retail Distribution Users

Vendor	Relative Rating of Work by Retail Users*
C & L	4.5
CGI	4.3
Digital	4.0
IBM	3.8

*Rating: 5 - high, 1 = low (ratings by a small number of users).

There is sufficient interest in downsizing in this market to make it necessary for vendors to be prepared to support the use of client/server technology with retail prospects.

F

Utilities Market

1. Factors Affecting the Utilities Market

Factors that are affecting users of information services in the utilities market are ranked in importance in Exhibit IV-22.

- All the factors mentioned can have a positive impact on the use of IT and information services.
- Users at utilities emphasized that they need to improve their operations, service and use of IT, but several were uncertain if their budgets would support the changes they have in mind.

EXHIBIT IV-22

Factors Affecting Utilities

Factor	Relative Importance*
Pressure to Increase Productivity/ Cut Costs	4.1
Need for Service Improvement	3.7
Need to Upgrade Business Systems	3.6
Pressure to Improve Use of IT	3.4
Regulatory Changes and Reporting	3.1

*Rating: 5 = high, 1 = low.

The use of client/server technology and downsizing were given highest importance as technological trends, as shown in Exhibit IV-23.

- Users noted that they intended to use client/server technology with mainframe applications such as inventory, purchasing, materials management and operations systems.
- The use of distributed data bases and new network capabilities were also mentioned as trends on which users expected to take action in view of their requirements for data usage and connectivity.

EXHIBIT IV-23

Technological Directions in Utilities

Technology	Relative Importance*
Client/Server Technology	4.1
Downsizing	3.7
Open Systems	3.6
Distributed Data Bases	3.5
CASE	3.3
New Network Technology	3.1
EDI	2.2
Re-engineering	1.9
Imaging	1.8

*Rating: 5 = high, 1 = low.

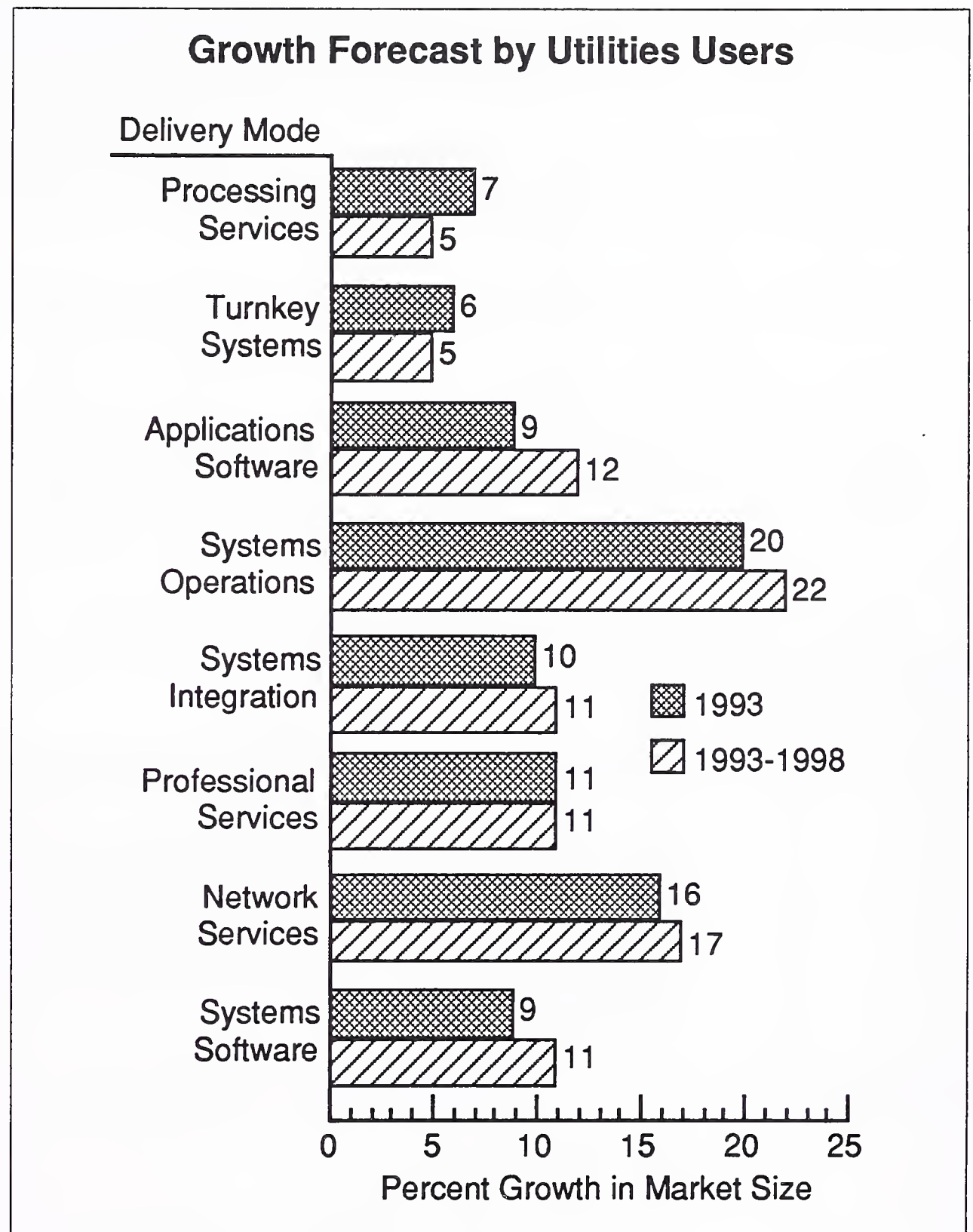
2. Growth of Information Services in Utilities, 1993-1998

The growth rates for the use of information services shown in Exhibit IV-24 indicate that SO will be increasingly valued as a delivery mode.

- The two examples of rapid growth of information services use in utilities shown in Exhibit III-11 indicated use of SO.
- The major application mentioned in one case was material management. The other utility identified inventory and purchasing as the application areas of interest. Because these are components of a materials management solution, there was a similar need in both examples.

As illustrated in Exhibit IV-24, applications and systems software products show an increase in use over the next five years to support increasing use of client/server technology and the movement of work to this technology from processing services and turnkey systems. Both processing services and turnkey systems show decreasing use in the next five years as a result.

EXHIBIT IV-24



3. Rating Vendors Serving Utilities

The vendors of information services ranked highest for their work by utilities are led by Andersen Consulting, as shown in Exhibit IV-25. Andersen leads primarily because of its high rating for consulting work involving systems and equipment planning for projects. Leaders in market share in this market include IBM/ISM, Digital, SHL and Andersen.

EXHIBIT IV-25

Vendors of Information Services to Utilities Users

Vendor	Relative Rating of Work by Utilities Users*
Andersen Consulting	4.2
SHL	3.9
LGS	3.7
IBM	3.2
Digital	2.5

*Rating: 5 - high, 1 = low (ratings by 4 or more users).

G**Business Services Market****1. Factors Affecting the Business Services Market**

Although users of information services in business services feel the impact of funding limitations, the tax situation, and competitive pressures, as indicated in Exhibit IV-26, they feel that the beginning of an economic recovery is the most important factor in their marketplace. They report that the recovery, however weak it may be, is causing organizations to increase their use of business services.

EXHIBIT IV-26

Factors Affecting Business Services

Factor	Relative Importance*
Beginning of Recovery	3.8
Pressure to Lower Costs	3.7
Need to Improve Services	3.7
Need to Upgrade IT Use	3.6
Competitive Pressure	3.4
Funding Limitations	3.4
Tax Burden	3.1

*Rating: 5 = high, 1 = low.

Business services users do report a need to improve customer services and lower costs as well as a need to upgrade the use of IT. These needs will lead to greater use of information services.

The technology directions reported by business services users focus on downsizing and the use of client/server technology, as shown in Exhibit IV-27.

- Many business services firms are small companies that are seeking lower-cost alternatives for automation.
- Some larger business services users noted that client/server technology would be needed to enable their firms to expand their services to customers. They were also interested in the use of distributed data bases and business re-engineering to expand their automation, but admitted that they were not knowledgeable in either area.

EXHIBIT IV-27

Technological Directions in Business Services

Technology	Relative Importance*
Downsizing	4.0
Open Systems	4.0
Client/Server Technology	3.8
Re-engineering	2.5
New Network Technology	2.5
Distributed Data Bases	2.5
CASE	2.2
EDI	2.1
Imaging	1.7

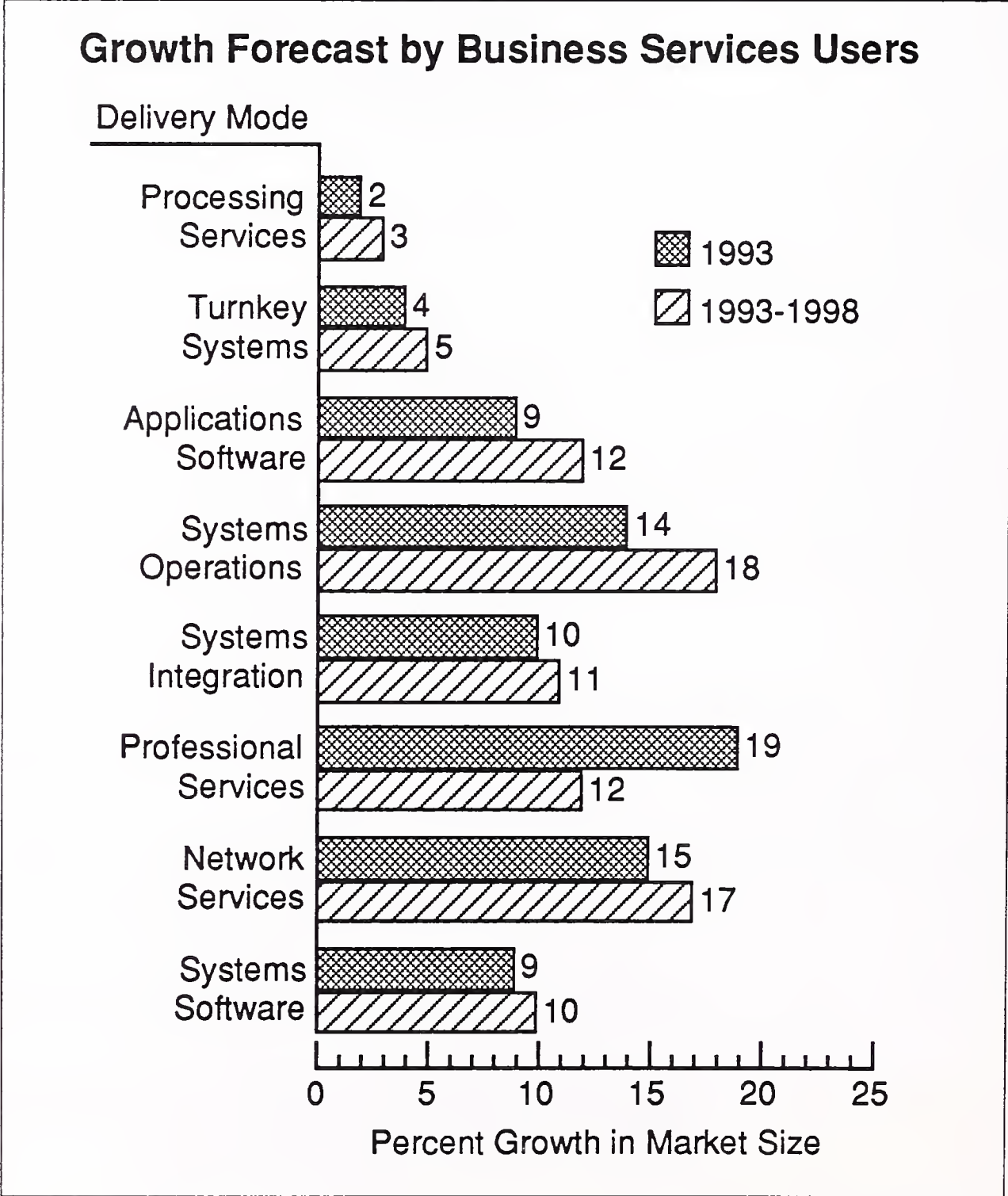
*Rating: 5 = high, 1 = low.

2. Growth of Information Services in Business Services, 1993-1998

The growth in information services use forecast by users in business services shown in Exhibit IV-28 has noticeable differences from the forecasts for markets discussed previously.

- There is increasing growth for the use of processing services and turnkey systems over the five-year period, because some of the small users in this market plan to increase their use of these modes to support increases in business.
- The use of professional services in this market will grow at a substantially high rate in 1993 to support growth in business and the need to change application systems to meet changing user needs. The growth of professional services will fall back to a slower rate after 1993 because users will begin to use systems operations, applications software products and SI to a greater extent to meet their needs.

EXHIBIT IV-28



The application systems mentioned by users in regard to the use of information services chiefly concerned accounting and financial functions, although task management and reporting and customer services were also mentioned.

None of the business services users reported an increase in use of information services large enough to warrant inclusion on the list in Exhibit III-11, but a high percentage of respondents reported some increases in use. Overall, there will be growth (CAGR) of 11% for information services expenditures for business services over the next five years, as shown in Exhibit III-8.

3. Rating Vendors Serving Business Services

IBM and SHL have the highest ratings by users in business services, as indicated in Exhibit IV-29, and together with Digital, they have the largest market shares in business services. All three of these vendors also supply equipment, which is of interest to a number of users in the business services market.

EXHIBIT IV-29

Vendors of Information Services to Business Services Users

Vendor	Relative Rating of Work by Business Services Users*
IBM	3.6
SHL	3.6
Andersen Consulting	3.5
Digital	2.9

*Rating: 5 - high, 1 = low.

H

Federal Government and Other Market Sectors**1. Factors Affecting the Federal Government and Other Market Sectors**

Factors reported by information services users in the federal government and in other markets such as transportation and communications deal with issues similar to those mentioned for market sectors discussed in this section.

- In the federal government, there is a desire to cut or avoid costs and an inability to fund some projects. As a result, growth of information services expenditures is slow.
- In other areas, particularly communications, there is more willingness to spend funds for information services because early signs of recovery have been discerned by users, or they feel that information services are needed to improve business or meet competition.

Exhibit III-11 indicates that there are users in communications, miscellaneous (construction and agriculture) and medical markets making significant investments in information services.

- A variety of applications are of interest in communications, including inventory, bill processing, accounting and management reporting.
- A miscellaneous user reports that personnel and payroll applications will drive the use of software products.
- A medical user reports that accounting and property management application systems will drive the use of SI.

2. Rating Vendors Serving the Federal Government and Selected Other Market Sectors

Vendors of information services with a high rank for their work in the federal government and other market sectors are listed in Exhibit IV-30.

- CGI and EDS are noted by federal government users. Several other vendors were recognized for federal work, but ranked at lower levels.

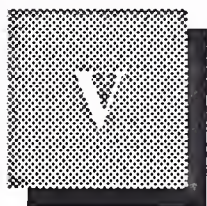
- DMR and IBM were ranked high in the communications market and IBM, Digital and Ernst & Young were ranked high in transportation. Communications stands out for the increases in use of information services that several users mentioned, as noted in Exhibit III-11.

EXHIBIT IV-30

Vendors Ranked High in Other Market Sectors

Vendor	Market Sector
CGI	Federal Government
Digital	Transportation
DMR	Communications
E & Y	Miscellaneous, Transportation
EDS	Federal Government, Miscellaneous
IBM	Communications, Transportation

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Information Services Market

The material in this chapter focuses on the use of information services delivery modes across all vertical markets. Data from user respondents about the use of delivery modes have been collected and aggregated to develop exhibits.

A

Processing Services Market

1. Factors Encouraging Use of Processing Services

The factors that information services users report as drivers in regard to the use of processing services focus on the solution and experience that vendors have available, as shown in Exhibit V-1.

- Most of these users state that they are looking for an expedient or rapid answer to a problem that will not require much or any development time or internal resources.
- Many users also stated that they had been using processing services, and it was easy to let increases in business be accommodated by expanding use of that mode.

EXHIBIT V-1

Factors Driving Use of Processing Services

Factor	Relative Importance to User Respondents*
Available Solutions	3.8
Experience of Vendor	3.6
Growth of Business	3.6
Cost or Time to Convert	3.4

*Rating: 5 = high, 1 = low.

The cost or time to convert solutions to another mode also encourages users to continue to use processing services, as noted in Exhibit V-1. Many companies are continuing to use processing services in a passive manner without examining the benefits of processing versus other modes.

There can be aggressive approaches to the use of processing services (as well as systems operations) that examine trade-offs between internally controlled operations, vendor expertise and resources, and costs in deciding to use a processing service, but those considerations were only mentioned by some users of processing.

2. Factors Inhibiting Use of Processing Services

Vendors should analyze the motives behind the use of processing services at the current time, because many users are exploring other alternatives and might suddenly turn to workstation solutions as well as software products that could enable them to move processing work in-house, as indicated in Exhibit V-2.

- Most continuing users of processing services felt that they could reduce their costs by moving in-house.
- Many users also argued that moving in-house with client/server technology or standalone workstations could give them opportunities to easily add other work.

EXHIBIT V-2

Factors that Can Inhibit Use of Processing Services

Factor	Relative Importance to User Respondents*
Processing Cost vs. Workstation/PC	4.3
New Software Products	4.1
Ease of Expanding Workstation/PC Use	3.7

*Rating: 5 = high, 1 = low.

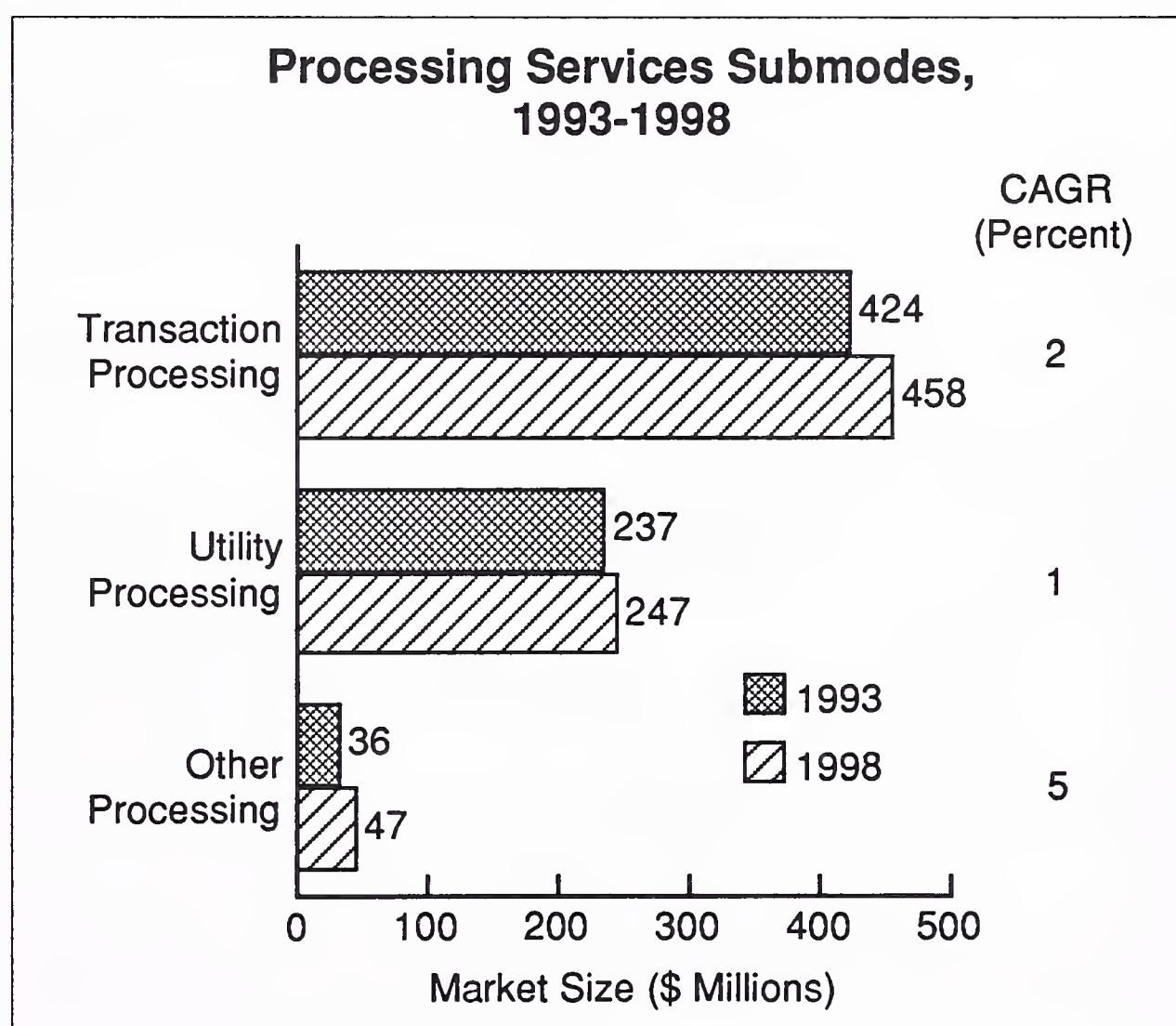
In view of this outlook, vendors of processing services might consider strategies for offering a systems operations mode that would offer more incentives for continuing use of a vendor or offer software products or turnkey solutions to help clients move in-house in the event that it seems likely.

3. Processing Services Market, 1993-1998

Exhibit V-3 shows the growth of processing services by submode over the next five years.

- Use of transaction and utility processing continues to grow but at very slow rates.
- Work is being diverted to client/server and workstation technology and to systems operations, which involves longer term contracts and handling the work of a function or department of a company. The latter is more attractive to users and less likely to be moved in-house.

EXHIBIT V-3



Work classified as “other processing” is growing at a faster rate than transaction processing, due chiefly to rising interest in disaster recovery support, which is included in this category.

4. Changes in Use of Processing Services

Based on information supplied by users, a list of changes in expenditures for processing services by application as developed, as shown in Exhibit V-4.

- In some application areas such as payroll, a sizable percentage of the users who reported impending changes expect to decrease their use of processing services. One processing vendor reported that it is necessary to aggressively sell new business and try to hold on to part of the old business in this application area as a result of this turnover.
- In some application areas, such as financial, accounting, transaction processing and manufacturing, work is being moved in-house to client/server systems or to systems operations vendors at the same time that some users are increasing the use of processing services. Processing vendors should analyze new customers to determine how likely they are to move in the future and what services might be offered to keep them.

EXHIBIT V-4

Changes in Use of Processing Services Reported by Users

Number of Users	Most Common Applications	Increases, Decreases Planned by Users
5	Payroll	40% increase; 60% decrease
9	Financial, accounting, billing	56% increase; 44% decrease
5	Transaction processing	40% increase; 60% decrease
4	Manufacturing, MRP related	25% increase; 75% decrease
4	Customer data or sales data analysis	75% increase; 25% decrease
3	Other	67% increase; 33% decrease

There is processing work that shows a favorable increase, such as sales analysis and billing, where small or busy companies can make use of available expertise and capability to address critical work. There is also a desire by users to have some workloads moved to processors so that definite cost reductions can be achieved. Vendors must evaluate what actions—including pricing changes, features or new services—can hold on to these customers, because new technology and expanding use of other information services are constant threats to this work.

B**Turnkey Systems Markets****1. Factors Encouraging Use of Turnkey Systems**

The factors that information services users report in relation to the use of turnkey systems are similar to those reported for processing services, as shown in Exhibit V-5.

- Available solutions and the experience of vendors is important for users who feel they must meet business objectives in a short time. The relatively short implementation time for turnkey systems is reported to be of importance in this regard.
- The ability to predict cost savings through the use of a turnkey is also important to users. Several users report that they were able to accurately determine what their cost and savings would be by inspecting the use of a turnkey elsewhere.

EXHIBIT V-5

Factors Driving Use of Turnkey Systems

Factor	Relative Importance to User Respondents*
Available Solutions	4.1
Experience of Vendor	4.0
Relatively Fast Implementation	3.9
Cost Savings	3.9

*Rating: 5 = high, 1 = low.

Users report that turnkey systems offer them an opportunity to obtain an in-house solution that they can utilize in accordance with their own schedules and modify or upgrade as needed.

2. Factors Inhibiting Use of Turnkey Systems

Although turnkey solutions meet the needs of some users, others believe that they have limitations, as indicated in Exhibit V-6.

- Possible limitations were mentioned in regard to the capacity of the system, transaction processing speed, data base capacity and report capabilities.

- Limitations in upgrading solutions to utilize new or larger capacity platforms or incorporate modifications in software products were also of concern.

EXHIBIT V-6

Factors that Can Inhibit Use of Turnkey Systems

Factor	Relative Importance*
Limited Capacity	3.8
Limitations in Upgrading	3.7
Commitment to Vendor	3.5

*Rating: 5 = high, 1 = low.

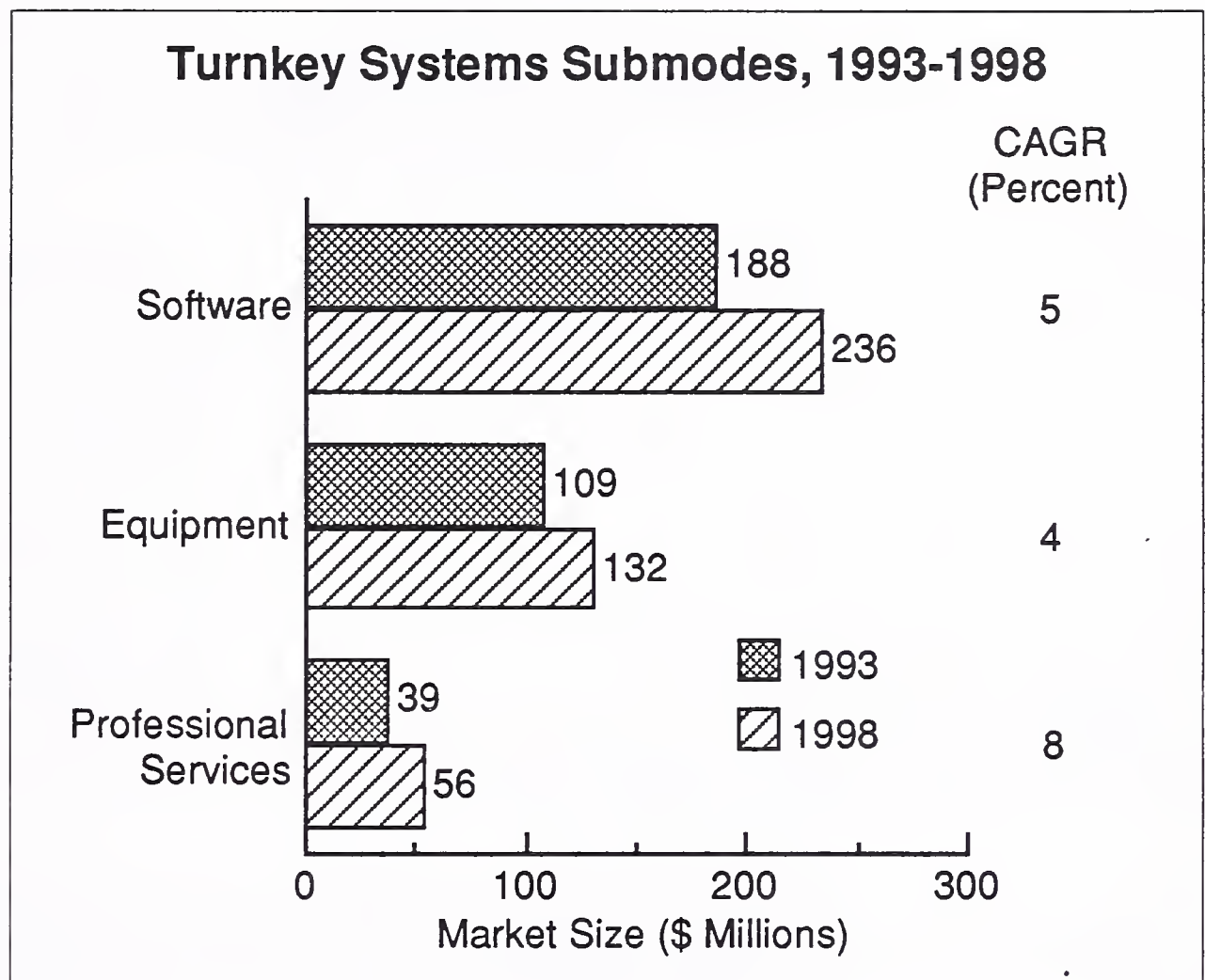
Several users also felt that the use of turnkey systems could result in too great a commitment to a vendor. They felt that the vendor commitment could influence users to follow the equipment and/or application directions that the vendor decided were appropriate, rather than those best suited to user circumstances.

3. Turnkey Systems Market, 1993-1998

Information on the growth in use of turnkey systems submodes shown in Exhibit V-7 indicates that the cost of the equipment component of the solution is not growing as fast as the software or professional services components.

- This situation is partially due to the decreasing cost of equipment solutions. Many turnkey systems are now available on client/server systems and standalone workstations that were formerly available on mainframes or minicomputers, as in the case of distribution.
- The software features and ability to customize solutions with professional services work are also growing in use.

EXHIBIT V-7



Although expenditures for turnkey systems are not growing as rapidly as those for other modes, there is steady growth in use forecast for these solutions.

4. Changes in Use of Turnkey Systems

Changes in use of turnkey systems in relation to application areas is shown in Exhibit V-8.

- Accounting and financial systems are the application areas in which the greatest amount of change will occur. Most of the increases in use that are planned involve application systems developed for specific market sectors such as wholesale or retail distribution.
- Decreases in use generally involve a movement of work to in-house client/server technology. Users claim that these moves also involve an expansion of functional capabilities.

EXHIBIT V-8

Changes in Use of Turnkey Systems Reported by Users

Number of Users	Most Common Applications	Increases, Decreases Planned by Users
12	Accounting, finance	75% increase; 25% decrease
6	Order entry, process	67% increase; 33% decrease
4	Sales analysis	100% increase
4	Manufacturing, work management	25% increase; 75% decrease
3	Office administration	100% increase
3	Other	67% increase; 33% decrease

Many of the increases in usage were made for standalone workstation or client/server technology. However, there is also increased use of main-frame and minicomputer turnkey solutions in manufacturing, accounting and order processing functions, but the vendors involved with these solutions are generally implementing or exploring downsized solutions.

C

Applications Software Products Market

1. Factors Encouraging Use of Applications Software Products

The factor that was highlighted by users as a stimulant for using applications software products focused on business objectives, as illustrated in Exhibit V-9.

- One of the objectives that users are interested in achieving through applications software products is becoming more competitive. Products that can improve customer service or facilitate order entry and processing are sought to meet this objective.
- Manufacturing, operations, accounting, and distribution software products that can improve productivity or lower costs are also being sought.
- Applications software products that can aid in improving the operation of business in merchandising, retail bank operations or human resources were also mentioned by users.

EXHIBIT V-9

Factors Driving Use of Applications Software Products

Factor	Relative Importance to User Respondents*
Need to Increase Productivity or Service to Meet Competition	4.1
Need to Speed Up Development	3.9
Lower Development Costs	3.9

*Rating: 5 = high, 1 = low.

Another factor that users felt encouraged the use of applications software products in general was the ability to lower development costs by using these products instead of developing software solutions in-house.

2. Factors Inhibiting Use of Applications Software Products

Some users feel that applications software products will require a high level of modification, as illustrated in Exhibit V-10.

- Another concern that could inhibit the use of software products is the possibility of upgrading to an equipment platform that could not run software products without more modification than was anticipated.
- There is also concern about the ability of vendors to support software products adequately in some corporate situations, as indicated in Exhibit V-10. Vendors may need case histories or references to overcome these arguments.

EXHIBIT V-10

Factors that Can Inhibit Use of Applications Software Products

Factor	Relative Importance*
Amount of Modification Needed	4.3
Possibility of Changing Platforms	3.8
Lack of Confidence in Ability to Support Products	3.6
Lack of Confidence in Vendor	3.3

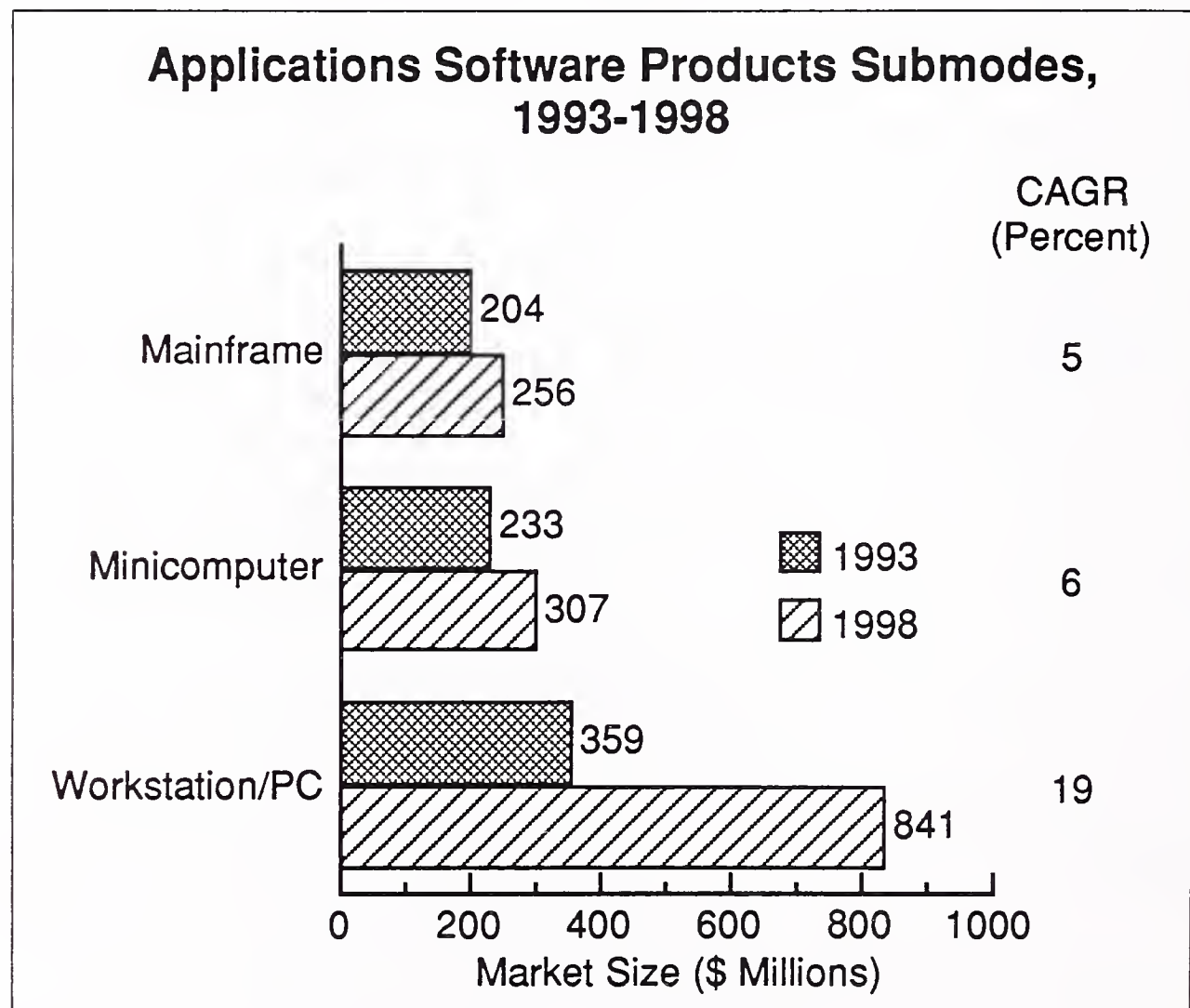
*Rating: 5 = high, 1 = low.

3. Applications Software Products Market, 1993-1998

The breakdown of the applications software products market shown in Exhibit V-11 emphasizes that products for workstation/PC platforms will command a greater share of expenditures over time.

- By 1998, software products on workstations/PCs will account for almost 60% of all expenditures in this delivery mode.
- Application products for workstations and client/server systems are becoming available for many business functions, including human resources, integrated accounting, trust, commercial loan, distribution and material management, according to users contacted during this study.

EXHIBIT V-11



4. Changes in Use of Applications Software Products

As Exhibit V-12 illustrates, the area in which greatest change in the use of applications software products is taking place is banking and finance.

- Many of the increases in use are involved with an integrated system utilizing a data base. Some of these increases involve client/server platforms, but a number are still reported to be involved with mainframe and minicomputer technology.

- A number of the increases in this application area also involve accounting systems developed for specific market sectors such as banking or retail distribution.
- One of the underlying reasons for interest in accounting and financial applications software products, according to users, is the high level of interest in reducing, controlling and analyzing costs that has been brought about by the recent problems in the economy.

EXHIBIT V-12

Changes in Use of Applications Software Products Reported by Users

Number of Users	Most Common Applications	Increases, Decreases Planned by Users
48	Accounting, finance, billing	81% increase; 19% decrease
13	Purchasing, order generation for supplier	100% increase
9	Market or sales analysis	75% increase; 25% decrease
8	Inventory, warehouse	85% increase; 15% decrease
7	Manufacturing, MRP	100% increase
76	Other	89% increase; 11% decrease

The decreases in use that some users are planning for accounting and financial applications software products and for manufacturing and inventory products will result from expanding use of systems integration, professional services and systems operations as solutions.

Users plan increases in product use for many application areas in addition to those highlighted in Exhibit V-12, including merchandising, investment, portfolio management/reporting, payroll, logistics, material management, work scheduling, order entry, POS, ATM networks, EDI, trust, trading, insurance agency operation, customer service and oil exploration. Users also expect applications software products to address many more industry-specific functions in the future.

D**Systems Operations Market****1. Factors Encouraging Use of Systems Operations**

The decision to use systems operations often involves a longer term evaluation than the use of other services would require, and one of the chief factors influencing such a decision is the possibility of reducing overall costs.

- Users confirm that cost savings are a major motive, as shown in Exhibit V-13.
- Users also highlight personnel savings and the ability to rely upon the expertise of vendors in the use of IT as reasons for using systems operations (SO).

EXHIBIT V-13

Factors Driving Use of Systems Operations

Factor	Relative Importance to User Respondents*
Lower Overall Costs	4.2
Vendor Expertise	4.1
Personnel Savings	4.1
Method of Handling New Technology	3.7

*Rating: 5 = high, 1 = low.

Some users state that SO is a means of dealing with new technology because vendors are able to afford a research staff that can stay up to date on new capabilities. This provides more assurance that developments that can be advantageous for user application systems will be recognized and taken advantage of. This concentrates attention upon one of the issues that information systems users have identified as a major challenge: dealing with the complex changes in IT equipment and information services that have been taking place.

2. Factors Inhibiting Use of Systems Operations

Despite the appeal and rapid growth of systems operations, users do mention reservations about its use that could inhibit business, which are noted in Exhibit V-14.

- The chief consideration is a loss of control of the use of IT. Many users feel that systems operations vendors will be in a position to dictate whether systems upgrades or application changes can be made rapidly enough to meet business needs.
- Users also feel that it may be difficult to change vendors or reverse the move to systems operations once a vendor starts to take over responsibility for operations.

EXHIBIT V-14

Factors that Can Inhibit Use of Systems Operations

Factor	Relative Importance*
Loss of Control	3.9
Difficult to Reverse	3.8
Difficult to Change Vendors or Delivery Modes in Use	3.7

*Rating: 5 = high, 1 = low.

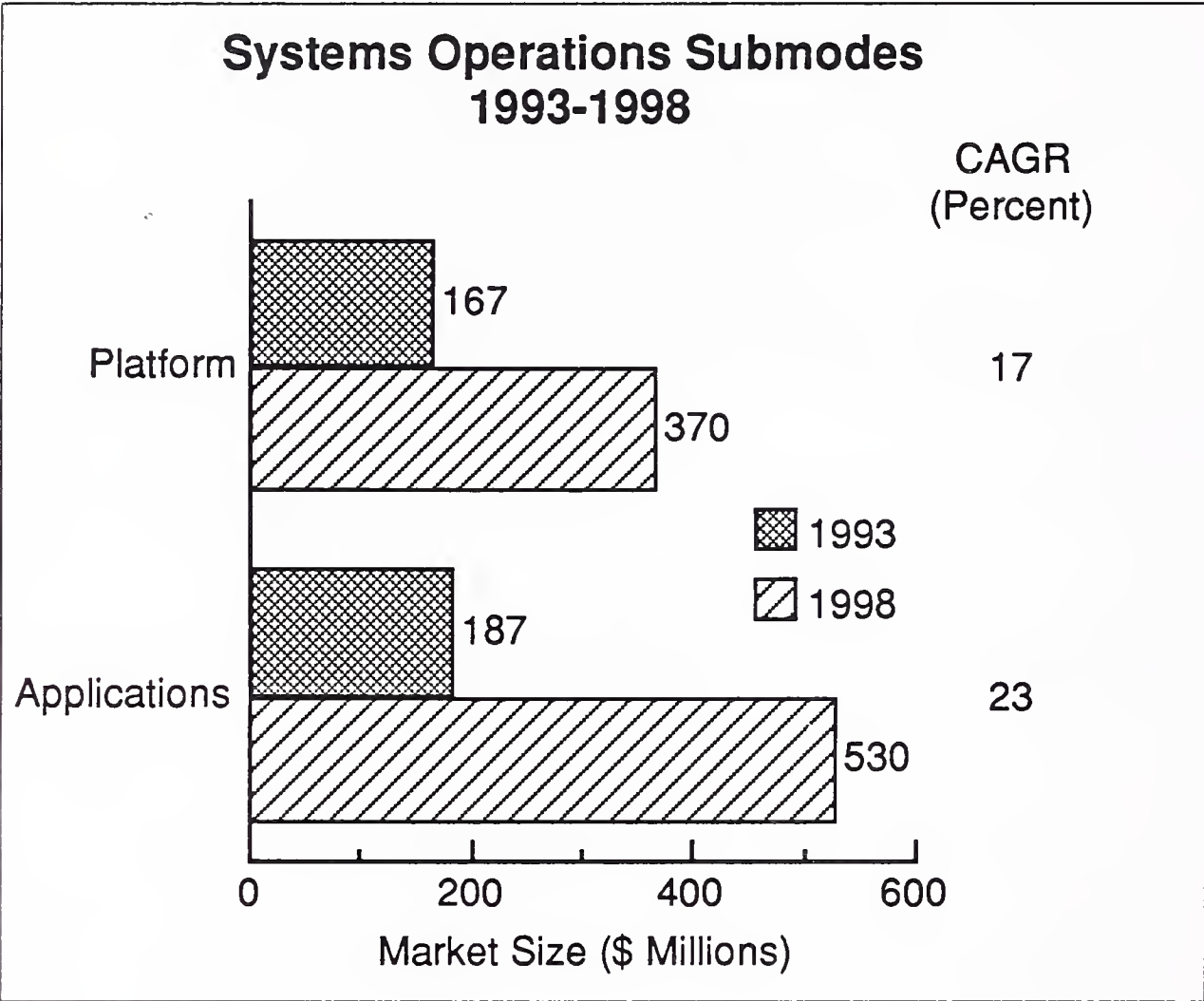
3. Systems Operations Market, 1993-1998

As Exhibit V-15 indicates, user expenditures are rising more rapidly for the applications submode of systems operations than for the platform submode.

- The platform mode involves the operation and possible ownership of platform capabilities for a corporate department or IS function on a long-term basis.
- The applications submode involves the provision of staff capabilities to handle modification and development of the systems that are being run as well as operational responsibilities.

The more rapid growth of the applications submode suggests that users show interest in outsourcing more work over time and taking advantage of vendors' expertise and investment in developing capabilities.

EXHIBIT V-15



4. Changes in Use of Systems Operations

As Exhibit V-16 indicates, the changes in use planned in regard to systems operations are only concerned with increases.

- There are a few areas, however, where users are considering other alternatives as well as systems operations, including financial, trust and material management applications.
- In these situations, users report that they might use systems integration, professional services and/or applications software products instead of SO.

Most of the application areas being considered for SO are regarded as very important to business for the users considering the move to SO. Some users emphasized that they were interested in the expertise of vendors for MRP, material management, integrated accounting, distribution and other systems.

EXHIBIT V-16

Changes in Use of Systems Operations Reported by Users

Number of Users	Most Common Applications	Increases, Decreases Planned by Users
6	Financial, accounting	100% increase
5	Manufacturing, MRP operations	100% increase
4	Trust, branch automation and other banking	100% increase
4	Sales administration and analysis	100% increase
3	Material management and purchasing	100% increase
6	Other	100% increase

E

Systems Integration Market

1. Factors Encouraging Use of Systems Integration

Factors that information services users feel are encouraging the use of systems integration involve the ability to analyze and implement complex systems. Complex systems are identified by users as ones that will require expertise in a number of areas including the applications software products that might be used, network components of the solution and familiarity with the platforms and tools that are appropriate for a solution.

- The specific points mentioned by users emphasize industry/application knowledge and technical expertise as well as implementing a complex system, as illustrated in Exhibit V-17.
- Users also report that the use of a systems integrator permits them to achieve a more flexible use of their own resources because the integrator will concentrate on supplying skills and equipment to meet the needs of the project rather than making it necessary for the user to make changes.

Users report that SI projects often require the consideration of new technology and particularly client/server technology. Users report that they expect integrators to help them deal with issues regarding this technology, such as splitting data and functions between client/server systems in different areas.

EXHIBIT V-17

Factors Driving Use of Systems Integration

Factor	Relative Importance to User Respondents*
Rapid Implementation	4.2
Need for Industry/Application Knowledge	4.0
Need for Technical Expertise	3.9
More Flexible Use of Resources	3.5

*Rating: 5 = high, 1 = low.

2. Factors Inhibiting Use of Systems Integration

As indicated in Exhibit V-18, the investment commitment required for SI projects, as well as the possible loss of control of projects, can inhibit SI expenditures. Users also feel that in-house staffs may gain only limited experience, which might reinforce the feeling that SI firms are gaining control over the use of IT.

- Some integrators incorporate material in their presentations to lessen these worries.
- A number of integrators offer training programs that emphasize the transfer of technical knowledge, to overcome feelings of limited experience.

EXHIBIT V-18

Factors that Can Inhibit Use of Systems Integration

Factor	Relative Importance*
Investment Commitment	4.3
Loss of Control	4.0
In-house Staff Gains Limited Experience	3.6

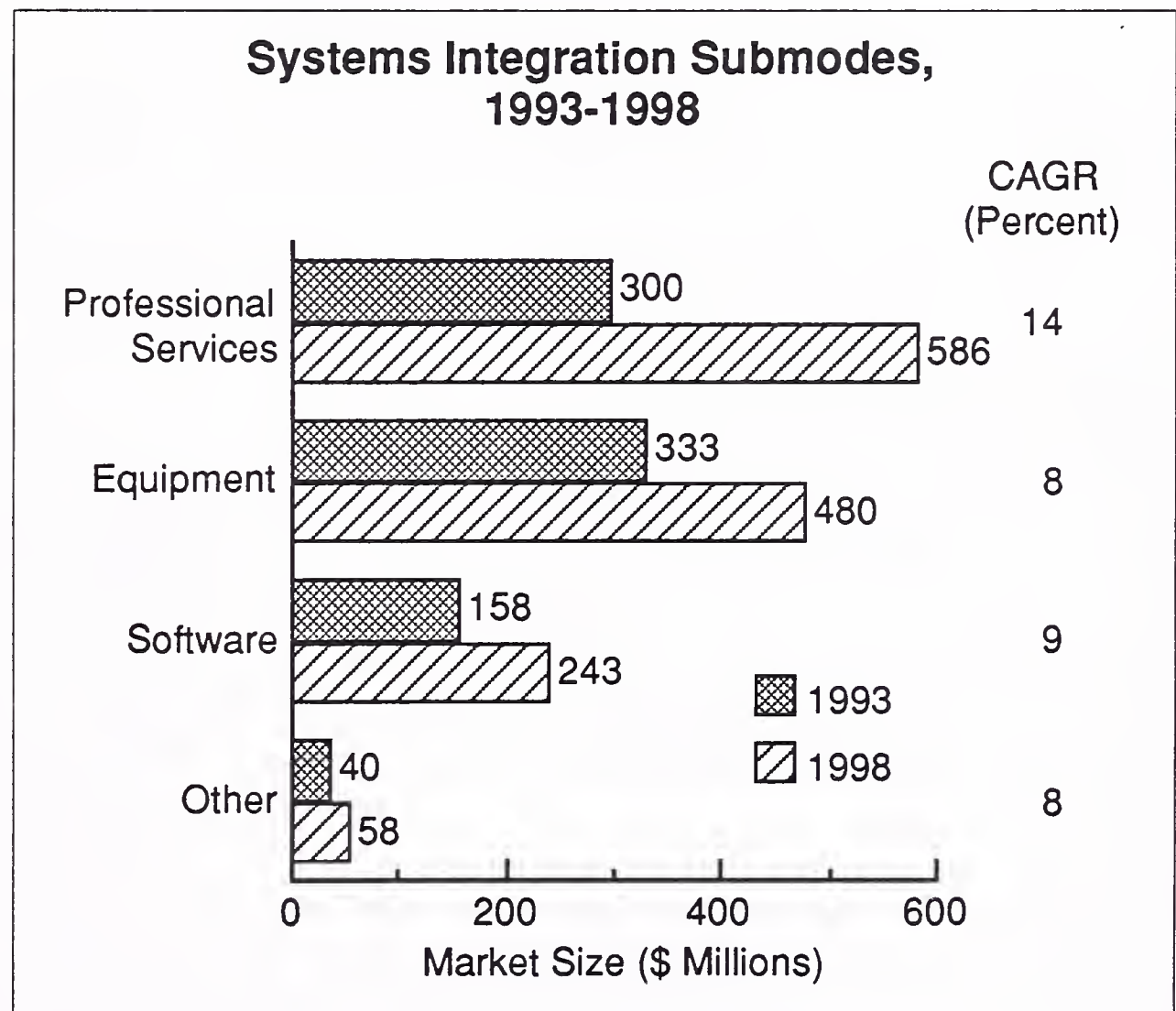
*Rating: 5 = high, 1 = low.

3. Systems Integration Market, 1993-1998

The increase in SI from \$831 million Canadian of user expenditures in 1993 to \$1,367 in 1998 can be broken down into the increases in delivery submodes shown in Exhibit V-19.

- By the end of the five-year period, professional services will become the leading submode because it is growing at a faster rate than is equipment.
- Software products expenditures are also growing slightly faster than equipment expenditures.

EXHIBIT V-19



There is a shift taking place in the use of equipment in both SI and professional services projects. In 1993, about 25% of these projects involved client/server technology or standalone workstations. In 1998, 75% of them will, according to forecasts. This will tend to cause a slightly lower growth rate for equipment expenditures.

4. Changes in Use of Systems Integration

Based on information from user respondents, changes in use of systems integration (SI) will chiefly involve increases, as shown in Exhibit V-20.

- Users involved in financial and banking projects will decrease their use of SI vendors and use other alternatives such as applications software products and/or professional services.
- Other users in the same application areas indicated that they were considering SI or professional services for work. There were additional users in application areas less frequently encountered who were also weighing the use of SI against other information services modes.

EXHIBIT V-20

Changes in Use of Systems Integration Reported by Users

Number of Users	Most Common Applications	Increases, Decreases Planned by Users
19	Financial accounting	95% increase, 5% decrease (two will use SI or professional services)
8	Inventory, warehouse	100% increase
6	Sales and market analysis	100% increase
6	Banking functions, including trading, ATM and branch systems	84% increase; 16% decrease (two will use SI or professional services)
5	Manufacturing, MRP	100% increase
4	Distribution, logistics	100% increase
3	Other	100% increase (all will use SI or professional services)

Although many users plan to use SI firms in such areas as inventory, manufacturing, distribution and banking because of their expertise and reputations in those areas, there is more worry about the use of SI than many vendors are aware of.

- Some users worry about staying up to date in their functional areas if SI vendors are brought in.
- Other users worry about the experiences of firms that have used unqualified SI vendors. Firms (particularly, smaller ones) that have been hired for work have been found to be deficient in technical and industry/application knowledge.

F**Professional Services Market****1. Factors Encouraging Use of Professional Services**

Needs for specific capabilities encourage organizations to use professional services, as shown in Exhibit V-21.

- Users report that these needs are divided between application and technical expertise.
- However, a number of users stated that the paramount need they identify with professional services firms when personnel are being sought for temporary assignments is for technical skill, such as experience with Windows, Oracle data base software or UNIX. The latter was reported to be of significant interest to a number of users at the present time.

EXHIBIT V-21

Factors Driving Use of Professional Services

Factor	Relative Importance to User Respondents*
Need for Application and Industry Experience	4.2
Need for Technical Knowledge	4.1
Desire to Hold Personnel Count Below Peak Period Demand Levels	3.8

*Rating: 5 = high, 1 = low.

Organizations are anxious in many cases to obtain the use of technical personnel when emergencies arise or at peak periods of work so that the number of permanent personnel can be kept at lower levels, as noted in Exhibit V-21.

2. Factors Inhibiting Use of Professional Services

Plans to use professional services can always be inhibited by shortages of funds, as indicated in Exhibit V-22. Users also report that they have cut expenditures for professional services when they don't have confidence that vendors can do the job.

In some cases, users take a direction in systems development that will make less use of professional services.

- This could include using turnkey systems, processing or applications software products in situations where modification to the software systems utilized by vendors was minor or not required.
- Some users have stated that the use of downsizing has reduced use of professional services. This has happened in cases where software products have been used without modification or users have modified or used facilities available with the software to tailor systems to meet their needs.

EXHIBIT V-22

Factors that Can Inhibit Use of Professional Services

Factor	Relative Importance*
Financing Problems	4.4
Lack of Trust in Vendors	4.1
Interest in Downsizing	3.9

*Rating: 5 = high, 1 = low.

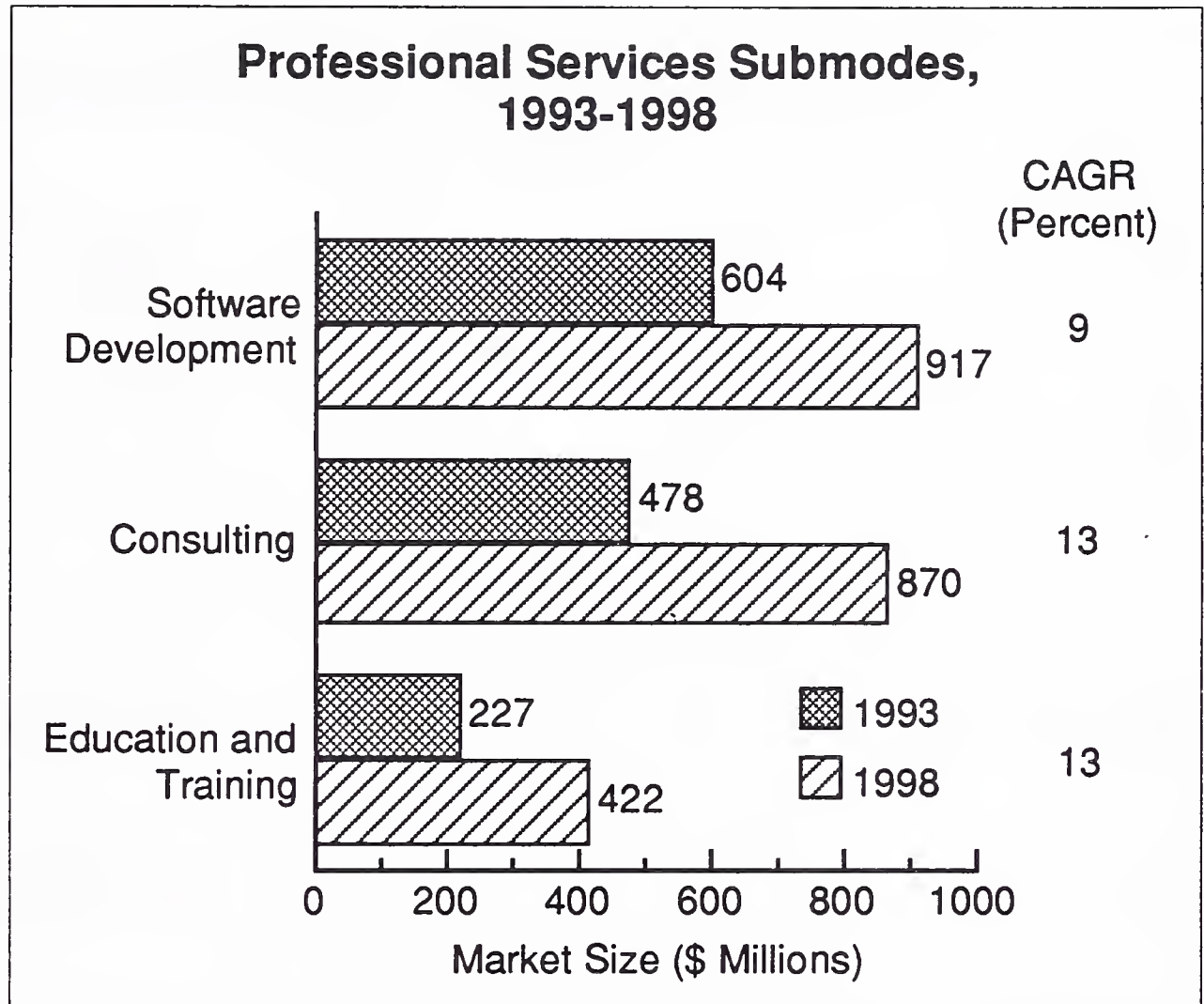
3. Professional Services Market, 1993-1998

The 11% CAGR forecast for user expenditures for professional services over the next five years is fueled by increases in consulting and education and training, as shown in Exhibit V-23.

- Education and training will enjoy a growth rate of 13% as a result of rising interest in training in software products used for downsizing and client/server systems. This training is being provided by firms dedicated to education and training as well as SI and professional services firms interested in development projects that will utilize client/server technology.
- Consulting is growing in use at a 13% rate also, due to the growing need for planning to support changes in the use of IT brought about by business restructuring. Some users stated that they also needed aid in planning to assign functions and data to client/server systems.

Users noted that they used professional services firms for technical aid as well as specific development tasks, particularly during projects involving new technology.

EXHIBIT V-23



4. Changes in Use of Professional Services

As shown in Exhibit V-24, the application areas in which the greatest number of users will increase their use of professional services are financial, accounting and billing.

- The constant need to modify applications in these areas to meet customer, management or government requirements is one of the reasons for this level of activity.
- Another reason for the activity is businesses' current general interest in analyzing, controlling and reducing costs, which is felt in all market sectors.

Inventory and warehouse management will have a significant percentage increase in professional services use driven by the need to control and reduce costs as well as by the need to expedite the availability of goods, parts or materials.

EXHIBIT V-24

Changes in Use of Professional Services Reported by Users

Number of Users	Most Common Applications	Increases, Decreases Planned by Users
52	Financial, accounting, billing	92% increase; 8% decrease
15	Inventory, warehouse	93% increase; 7% decrease
11	Sales and market analysis	82% increase; 18% decrease
9	Manufacturing, MRP or related	100% increase
8	Purchasing, order generation for suppliers	87% increase; 13% decrease
78	Other	92% increase; 8% decrease

Exhibit V-24 indicates that users expect to have decreases as well as increases in the use of professional services in most application areas. Also, several users indicated that they might use other information services in place of professional services.

- Users pointed out that alternatives such as applications software products and SI are always being evaluated.
- Users also stated that the use of alternatives is less likely where the vendor has considerable expertise in the application area and/or the software products or tools that are likely to be used.

G

Network Services Market

1. Factors Encouraging Use of Network Services

As Exhibit V-25 illustrates, demands for specific services such as EDI or EIS (electronic information services or on-line data bases of information) are primary reasons for using network services, according to users.

- Users also pointed out that cost benefits of using EDI for ordering and payment and EIS to supply pricing or industrial information generally provided justification for using these services.
- The expansion of networks in companies also encouraged the use of network services because it provided the means for implementing EDI or supplying on-line information to more functions or offices.

EXHIBIT V-25

Factors Driving Use of Network Services

Factor	Relative Importance to User Respondents*
Demand for EDI and Other Services	3.9
Cost Benefits	3.7
Expanding Networks	3.5

*Rating: 5 = high, 1 = low.

2. Factors Inhibiting Use of Network Services

Users identified a number of factors that could inhibit use of network services, such as attempts to use internal capabilities, as shown in Exhibit V-26.

- Internal systems, including fax, are in use in place of EDI despite their limitations.
- The possibility of mergers and acquisitions has resulted in delays in decisions to implement network services and network capabilities, according to some users.
- There is also reluctance to use vendors for certain network capabilities, although this factor plays a much smaller role in inhibiting work, according to users.

EXHIBIT V-26

Factors that Can Inhibit Use of Network Services

Factor	Relative Importance*
Attempt to Use Internal Systems	3.3
Mergers and Acquisitions	3.2
Reluctance to Use Vendors	3.1

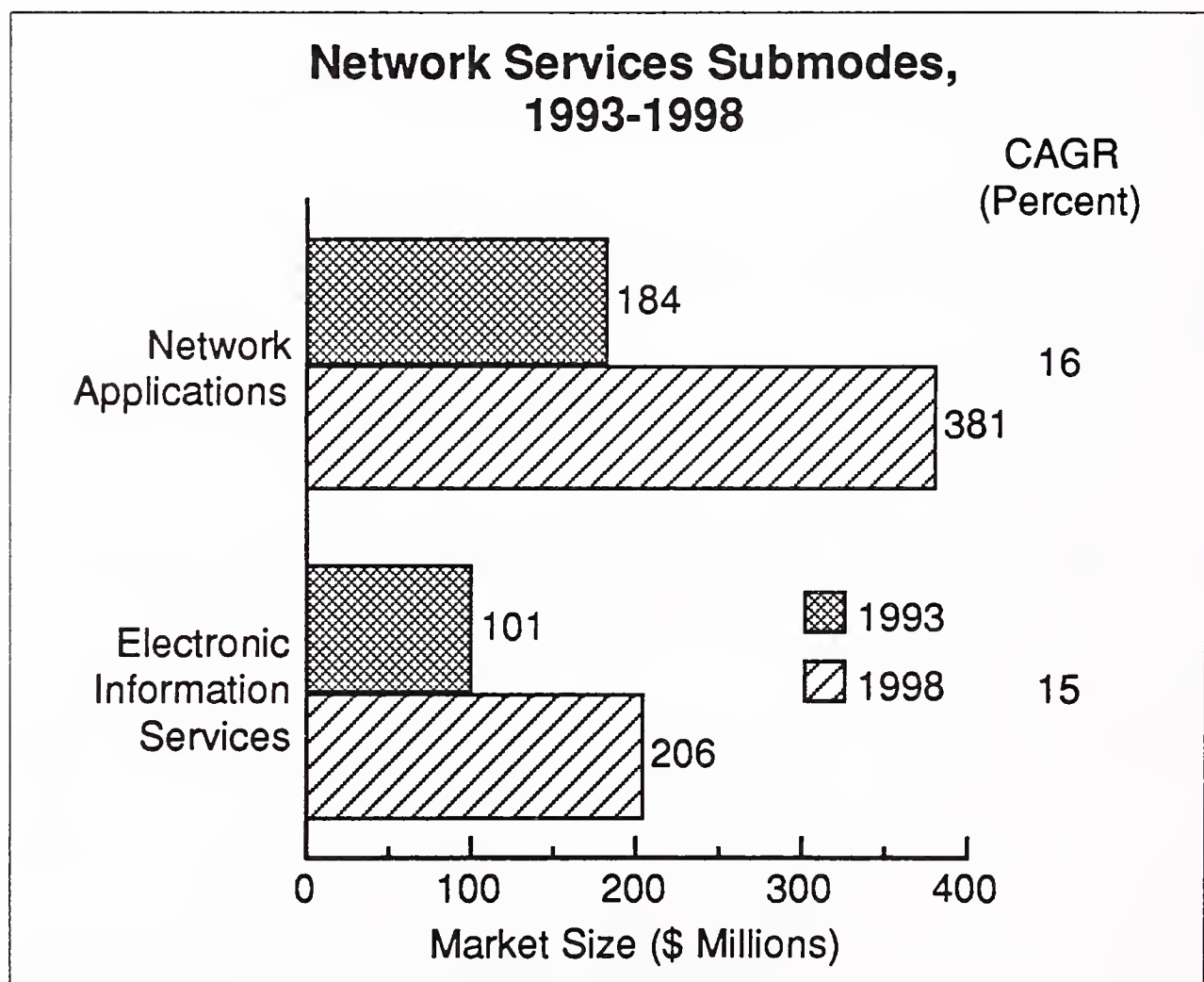
*Rating: 5 = high, 1 = low.

3. Network Services Market, 1993-1998

The growth of expenditures for network services over the next five years is fueled by the growth of both network applications and EIS, as illustrated by Exhibit V-27.

- Network applications is the largest submode and is growing at a slightly faster rate. Expenditures for it are fueled chiefly by interest in EDI, one of the services included in this submode, but some growth will also be contributed by VANs (value-added networks) and electronic mail.
- There are a number of on-line data bases that contribute to the growth of EIS, but the ones users claim are growing most rapidly are services providing equity prices and other financial information.

EXHIBIT V-27



4. Changes in Use of Network Services

The most common change in use of network services, according to user respondents, is an increase in use of EDI, as shown in Exhibit V-28.

- This change is mentioned most often by users in manufacturing, wholesale and retail distribution and banking/finance.

- Increased use of EDI was also mentioned by users in business services, transportation, utilities and miscellaneous market sectors.

EXHIBIT V-28

Changes in Use of Network Services Reported by Users

Number of Users	Most Common Use	Increases, Decreases Planned by Users
29	EDI	100% will increase use
12	EIS (on-line data bases)	100% will increase use
8	VANs	100% will increase use
4	Electronic mail	100% will increase use

Some users stated that the use of EDI was surging in their markets.

Users in banking, insurance, manufacturing, utilities, business services and distribution also mentioned increases in use of EIS or on-line data bases of financial, industrial and other information. Users also mentioned that they had plans in regard to VANs and electronic mail.

H**Systems Software Products Market****1. Factors Encouraging Use of Systems Software Products**

Factors that information services users report as important in encouraging the use of systems software products are shown in Exhibit V-29.

- The foremost reason is to support new equipment and network capabilities. Users emphasized that they were buying an increasing amount of systems software products for workstations to support the expanding use of this platform.

- Users also pointed out that a lack of high-level technical expertise increased the need for software products that could help to analyze or improve performance of equipment systems. The desire to increase the effectiveness of systems has grown in importance for larger platforms and is extending now to workstation equipment.

EXHIBIT V-29

Factors Driving Use of Systems Software Products

Factor	Relative Importance to User Respondents*
New Equipment (Particularly Workstations and Network Capabilities)	3.5
Lack of High-Level Technical Expertise	3.1
Desire to Increase Effectiveness of Systems	3.0

*Rating: 5 = high, 1 = low.

2. Factors Inhibiting Use of Systems Software Products

There are factors such as data center consolidation and cost of products that can inhibit expenditures for systems software products, as shown in Exhibit V-30. In addition, downsizing can reduce expenditures for systems software products.

- A reduction in the growth rate of mainframe and minicomputer systems is resulting from downsizing and the use of client/server systems, and this is accompanied by falling expenditures for systems software products.
- The growth of expenditures for systems software products for client/server technology has not been as large as the fall in expenditures for larger equipment in many cases, due to the lower price level of products for client/server systems.

The many new users of client/server technology as well as a movement to use enterprise software products on larger equipment are helping to continue the growth of systems software products, according to users.

EXHIBIT V-30

Factors that Can Inhibit Use of Systems Software Products

Factor	Relative Importance*
Downsizing, When It Reduces Need for More Expensive Products	3.4
Data Center Consolidation	3.3
Cost	3.3

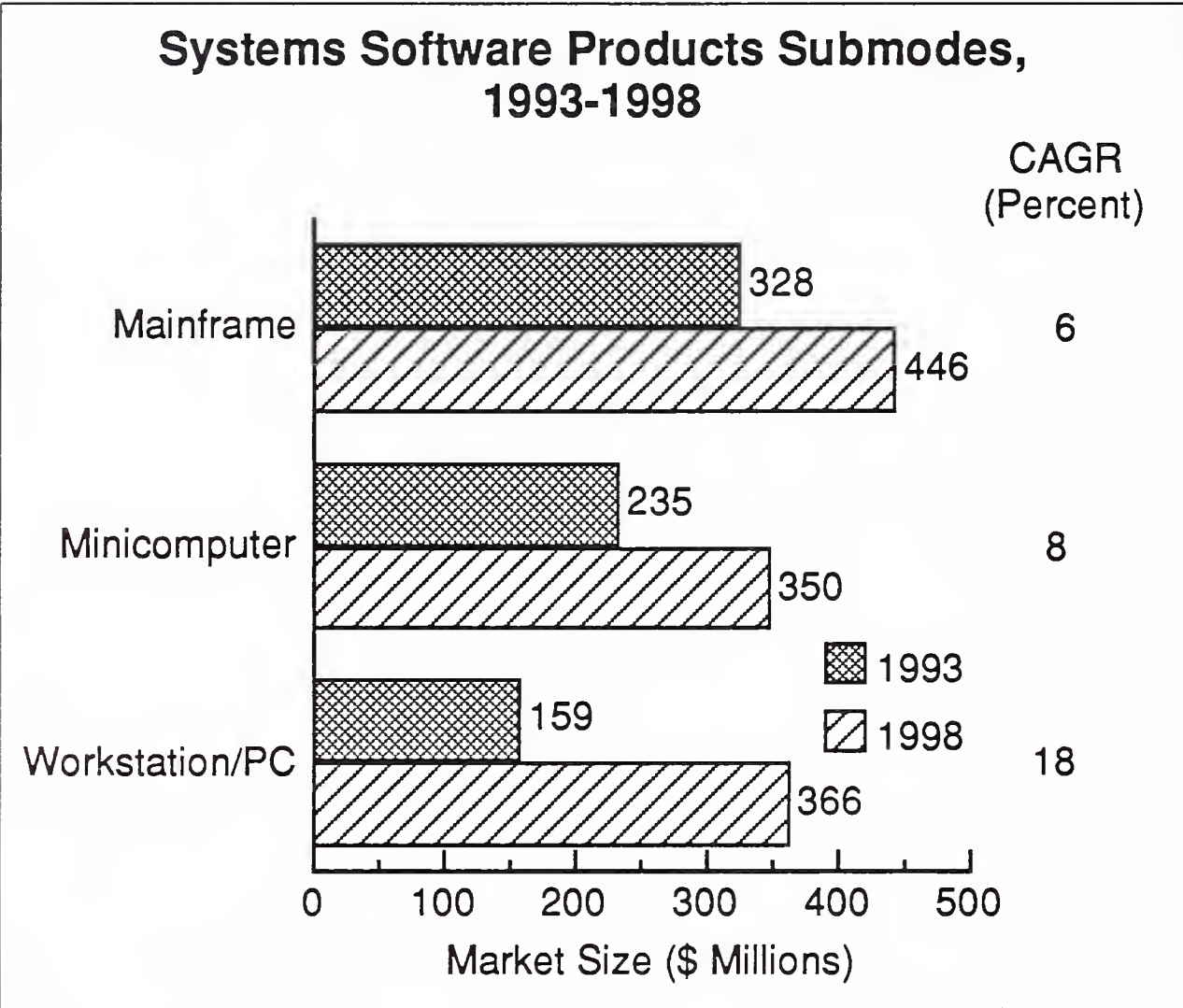
*Rating: 5 = high, 1 = low.

3. Systems Software Products Market, 1993-1998

Overall, the growth in expenditures for systems software products for workstation/PC equipment is responsible for the 1993-1998 growth rate of 12% in this delivery mode, as shown by Exhibit V-31.

- Expenditures are growing at a CAGR of 18% for workstation/PC systems software products and are responsible for an increase of \$207 million during the five-year period.
- Expenditures for mainframe and minicomputer systems are growing at a rate that is less than half of the rate for workstation/PC systems, and neither will contribute two-thirds as much in total dollar growth over the next five years.

EXHIBIT V-31



4. Changes in Use of Systems Software Products

For the users who reported changes in use of systems software products, the most common change reported was an increase in use to support client/server or open system platforms, as illustrated in Exhibit V-32. These changes involved increases in use of operating systems, including UNIX, graphical user interfaces, tools, languages and other products.

EXHIBIT V-32

**Changes in Use of Systems Software Products
Reported by Users**

Most Common Plans	Likelihood of Increase
Supporting Client/Server Use	High
Supporting Open Systems	High
Supporting Use of Distributed Data	High/Medium
Network expansion	Medium
Other	Medium

Other changes reported involved increases in use to support network expansion as well as to aid in operational management of mainframe and minicomputer platforms.

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Definition of Terms

A

Introduction

INPUT's *Definition of Terms* provides the framework for all of INPUT's market analyses and forecasts of the information services industry. It is used for all U.S. programs. The structure defined in Exhibit 1 is also used in Europe and for the worldwide forecast.

One of the strengths of INPUT's market analysis services is the consistency of the underlying market sizing and forecast data. Each year INPUT reviews its industry structure and makes changes if they are required. When changes are made they are carefully documented and the new definitions and forecasts reconciled to the prior definitions and forecasts. INPUT clients have the benefit of being able to track market forecast data from year to year against a proven and consistent foundation of definitions.

B

Overall Definitions and Analytical Framework

1. Information Services

Information Services are computer/telecommunications-related products and services that are oriented toward the development or use of information systems. Information services typically involve one or more of the following:

- Use of vendor-provided computer processing services to develop or run applications or provide services such as disaster recovery or data entry (called *Processing Services*)
- A combination of computer equipment, packaged software and associated support services which will meet an application systems need (called *Turnkey Systems*)

- Packaged software products, including systems software or applications software products (called *Software Products*)
- People services that support users in developing and operating their own information systems (called *Professional Services*)
- The combination of products (software and equipment) and services where the vendor assumes total responsibility for the development of a custom integrated solution to an information systems need (called *Systems Integration*)
- Services that provide operation and management of all or a significant part of a user's information systems functions under a long-term contract (called *Systems Operations*)
- Services that support the delivery of information in electronic form—typically network-oriented services such as value-added networks, electronic mail and document interchange (called *Network Applications*)
- Services that support the access and use of public and proprietary information such as on-line data bases and news services (called *Electronic Information Services*)
- Services that support the operation of computer and digital communication equipment (called *Equipment Services*)

In general, the market for information services does not involve providing equipment to users. The exception is where the equipment is part of an overall service offering such as a turnkey system, a systems operations contract, or a systems integration project.

The information services market also excludes pure data transport services (i.e., data or voice communications circuits). However, where information transport is associated with a network-based service (e.g., electronic data interchange services), or cannot be feasibly separated from other bundled services (e.g., some systems operations contracts), the transport costs are included as part of the services market.

The analytical framework of the information services industry consists of the following interacting factors: overall and industry-specific business environment (trends, events and issues); technology environment; user information system requirements; size and structure of information services markets; vendors and their products, services and revenues; distribution channels; and competitive issues.

2. Market Forecasts/User Expenditures

All information services market forecasts are estimates of *User Expenditures* for information services. When questions arise about the proper place to count these expenditures, INPUT addresses them from the user's viewpoint: expenditures are categorized according to what users perceive they are buying.

By focusing on user expenditures, INPUT avoids two problems which are related to the distribution channels for various categories of services:

- Double counting, which can occur by estimating total vendor revenues when there is significant reselling within the industry (e.g., software sales to turnkey vendors for repackaging and resale to end users)
- Missed counting, which can occur when sales to end users go through indirect channels such as mail order retailers

Captive Information Services User Expenditures are expenditures for products and services provided by a vendor that is part of the same parent corporation as the user. These expenditures are not included in INPUT forecasts.

Non-captive Information Services User Expenditures are expenditures that go to vendors that have a different parent corporation than the user. It is these expenditures which constitute the information services market analyzed by INPUT and that are included in INPUT forecasts.

3. Delivery Modes

Delivery Modes are defined as specific products and services that satisfy a given user need. While *Market Sectors* specify *who* the buyer is, *Delivery Modes* specify *what* the user is buying.

Of the nine delivery modes defined by INPUT, six are considered primary products or services:

- *Processing Services*
- *Network Services*
- *Professional Services*
- *Applications Software Products*
- *Systems Software Products*
- *Equipment Services*

The remaining three delivery modes represent combinations of these products and services, combined with equipment, management and/or other services:

- *Turnkey Systems*
- *Systems Operations*
- *Systems Integration*

Section C describes the delivery modes and their structure in more detail.

4. Market Sectors

Market Sectors or markets are groupings or categories of the buyers of information services. There are three types of user markets:

- *Vertical Industry* markets, such as Banking, Transportation, Utilities, etc. These are called “industry-specific” markets.
- *Functional Application* markets, such as Human Resources, Accounting, etc. These are called “cross-industry” markets.
- *Other* markets, which are neither industry- nor application-specific, such as the market for systems software products and much of the on-line data base market.

Specific market sectors used by INPUT are defined in Section E, below.

5. Trading Communities

Information technology is playing a major role in re-engineering, not just companies but the value chain or *Trading Communities* in which these companies operate. This re-engineering is resulting in electronic commerce emerging where interorganizational electronic systems facilitate the business processes of the trading community.

- A trading community is the group or organizations—commercial and non-commercial—involved in producing goods or services.
- Electronic commerce and trading communities are addressed in INPUT’s EDI and Electronic Commerce Program.

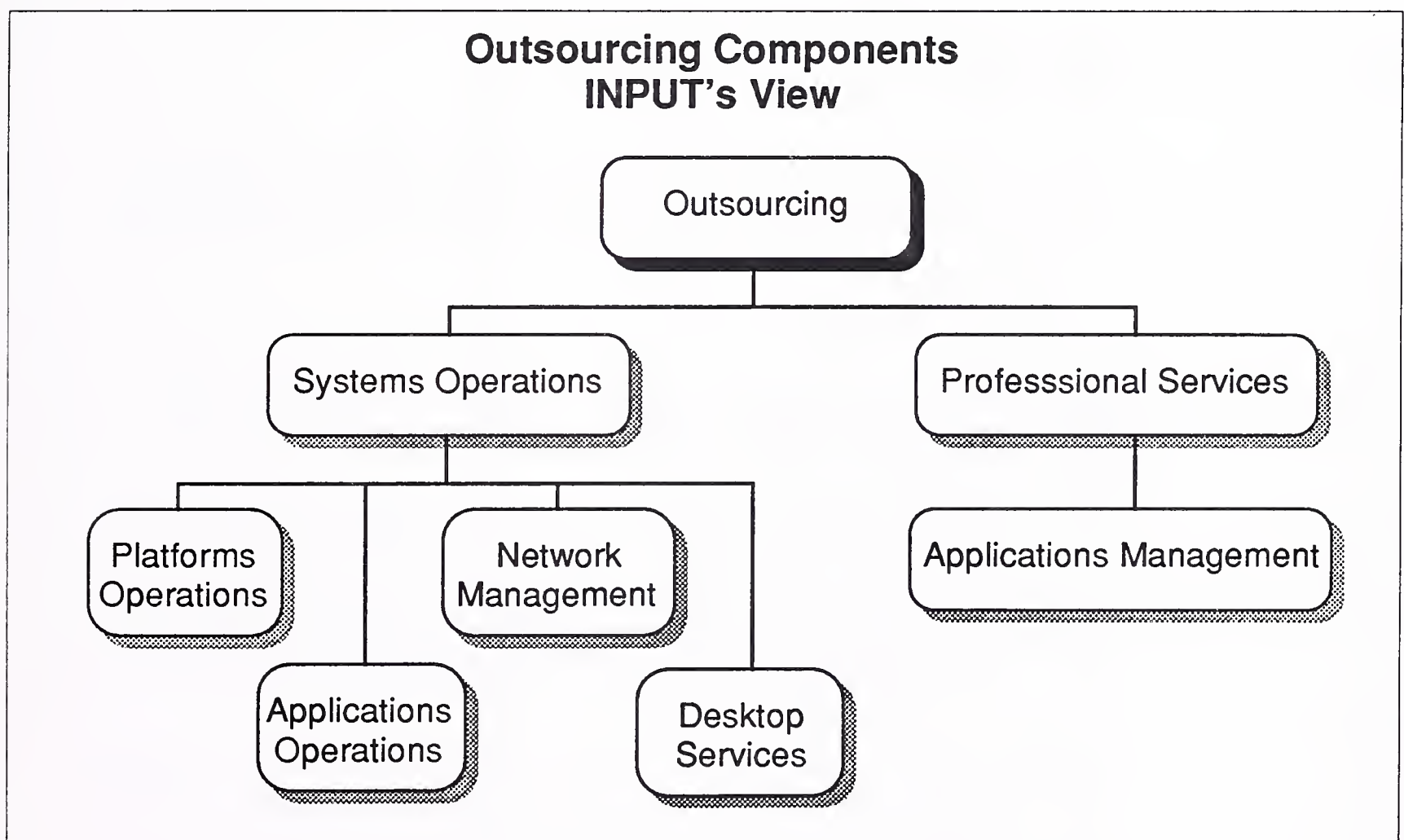
6. Outsourcing

Over the past few years a major change has occurred in the way clients are buying some information services. The shift has been labeled *outsourcing*.

INPUT views outsourcing as a change in the form of the client/vendor relationship. Under an outsourcing relationship, all or a major portion of the information systems function is contracted to a vendor in a long-term relationship. The vendor is responsible for the performance of the function.

INPUT considers the following submodes to be outsourcing-type relationships and in aggregate to represent the outsourcing market. See Exhibit 1. Complete definitions are provided in Section C of this document. INPUT provides these forecasts as part of the corresponding delivery modes.

EXHIBIT 1



- *Platform Systems Operations* - The vendor is responsible for managing and operating the client's computer systems.
- *Applications System Operations* - The vendor is responsible for developing and/or maintaining a client's applications as well as operating the computer systems.
- *Network Management* - The vendor assumes full responsibility for operating and managing the client's data communications systems. This may also include the voice communications of the client.

- *Applications Management/Maintenance* - The professional services vendor has full responsibility for developing and/or maintaining some or all of the applications systems that a client uses to support business operations. The services are provided on a long-term contractual basis.
- *Desktop Services* - The vendor assumes responsibility for the deployment, maintenance, and connectivity between the personal computers and/or intelligent workstations in the client organization. The services may also include performing the help-desk function. The services are provided on a long-term contractual basis.

C

Delivery Modes and Submodes

Exhibit 2 provides the overall structure of the information services industry as defined and used by INPUT. This section of *Definition of Terms* provides definitions for each of the delivery modes and their submodes or components.

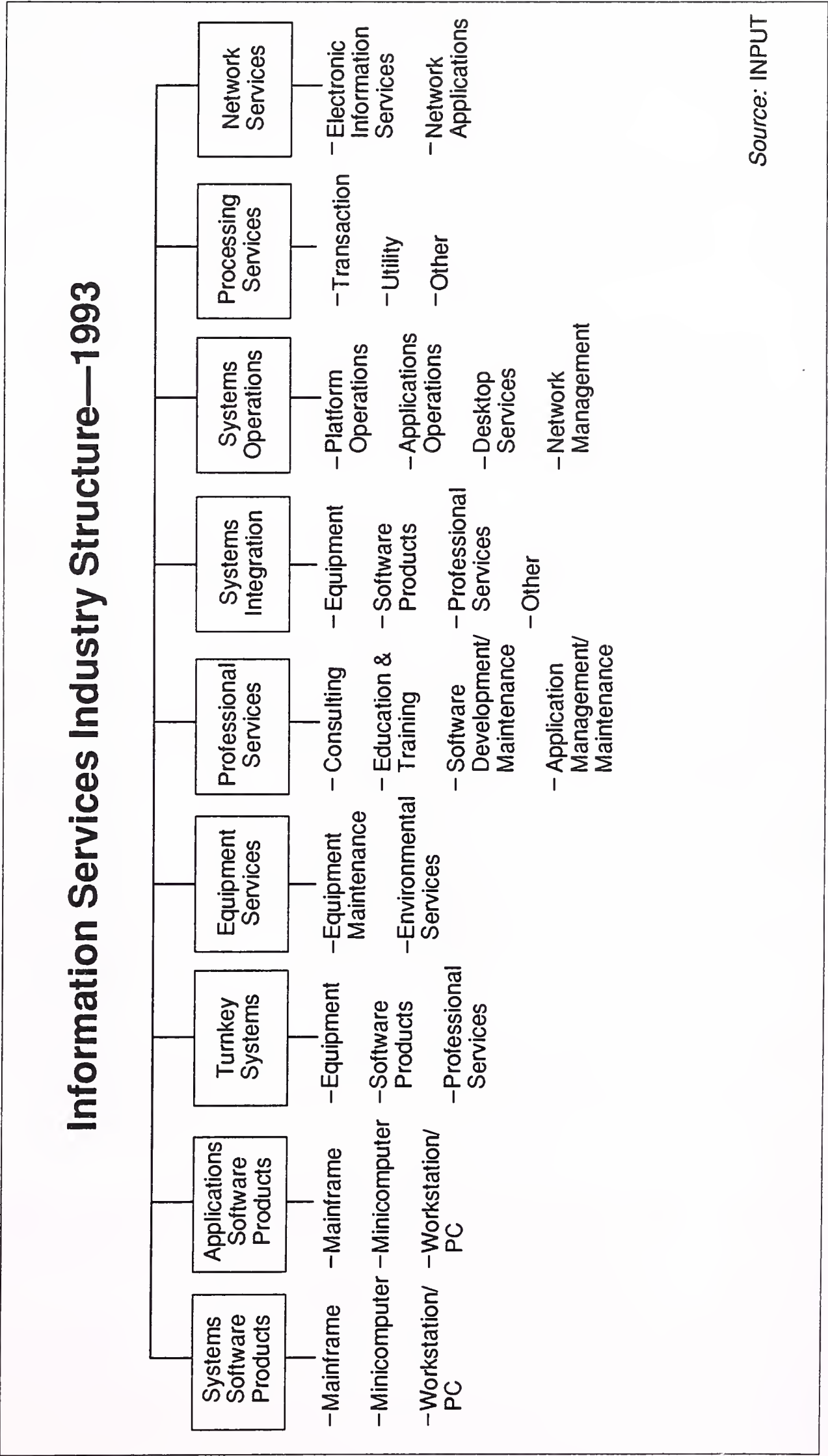
1. Software Products

INPUT divides the software products market into two delivery modes: systems software and applications software.

The two delivery modes have many similarities. Both involve purchases of software packages for in-house computer systems. Included are both lease and purchase expenditures, as well as expenditures for work performed by the vendor to implement or maintain the package at the user's sites. Vendor-provided training or support in operation and use of the package, if part of the software pricing, is also included here.

Expenditures for work performed by organizations other than the package vendor are counted in the professional services delivery mode. Fees for work related to education, consulting, and/or custom modification of software products are also counted as professional services, provided such fees are charged separately from the price of the software product itself.

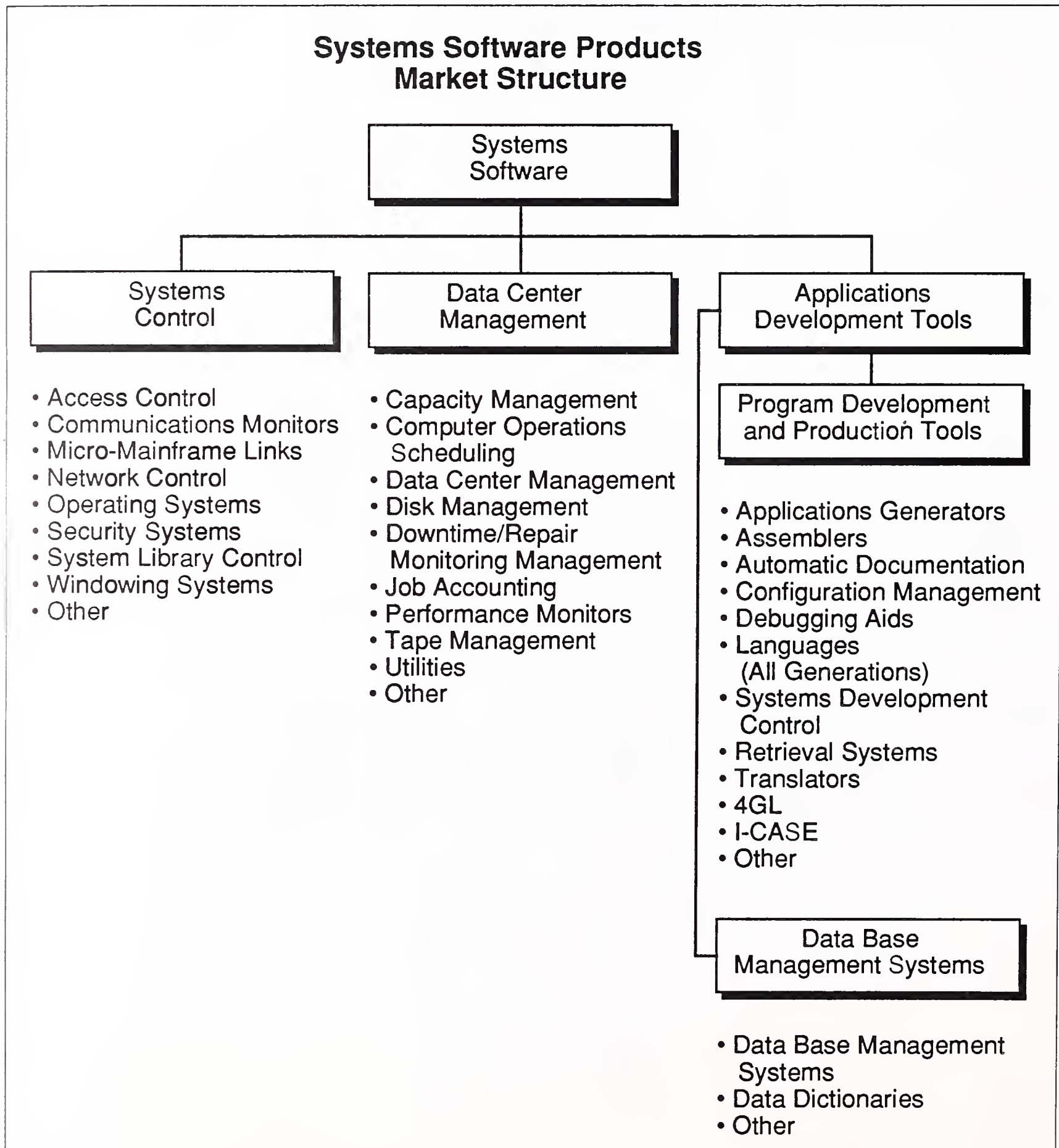
EXHIBIT 2



a. Systems Software Products

Systems software products enable the computer/communications system to perform basic machine-oriented or user interface functions. INPUT divides systems software products into three submodes. See Exhibit 3.

EXHIBIT 3



- *Systems Control Products* - Software programs that manage computer system resources and control the execution of programs. These products include operating systems, emulators, network control, library control, windowing, access control, and spoolers.
- *Operations Management Tools* - Software programs used by operations personnel to manage the computer system and/or network resources and personnel more effectively. Included are performance measurement, job accounting, computer operation scheduling, disk management utilities, and capacity management.
- *Applications Development Tools* - Software programs used to prepare applications for execution by assisting in designing, programming, testing, and related functions. Included are traditional programming languages, 4GLs, data dictionaries, data base management systems, report writers, project control systems, CASE systems and other development productivity aids.

INPUT also forecasts the systems software products delivery mode by platform level: mainframe, minicomputer and workstation/PC.

b. Applications Software Products

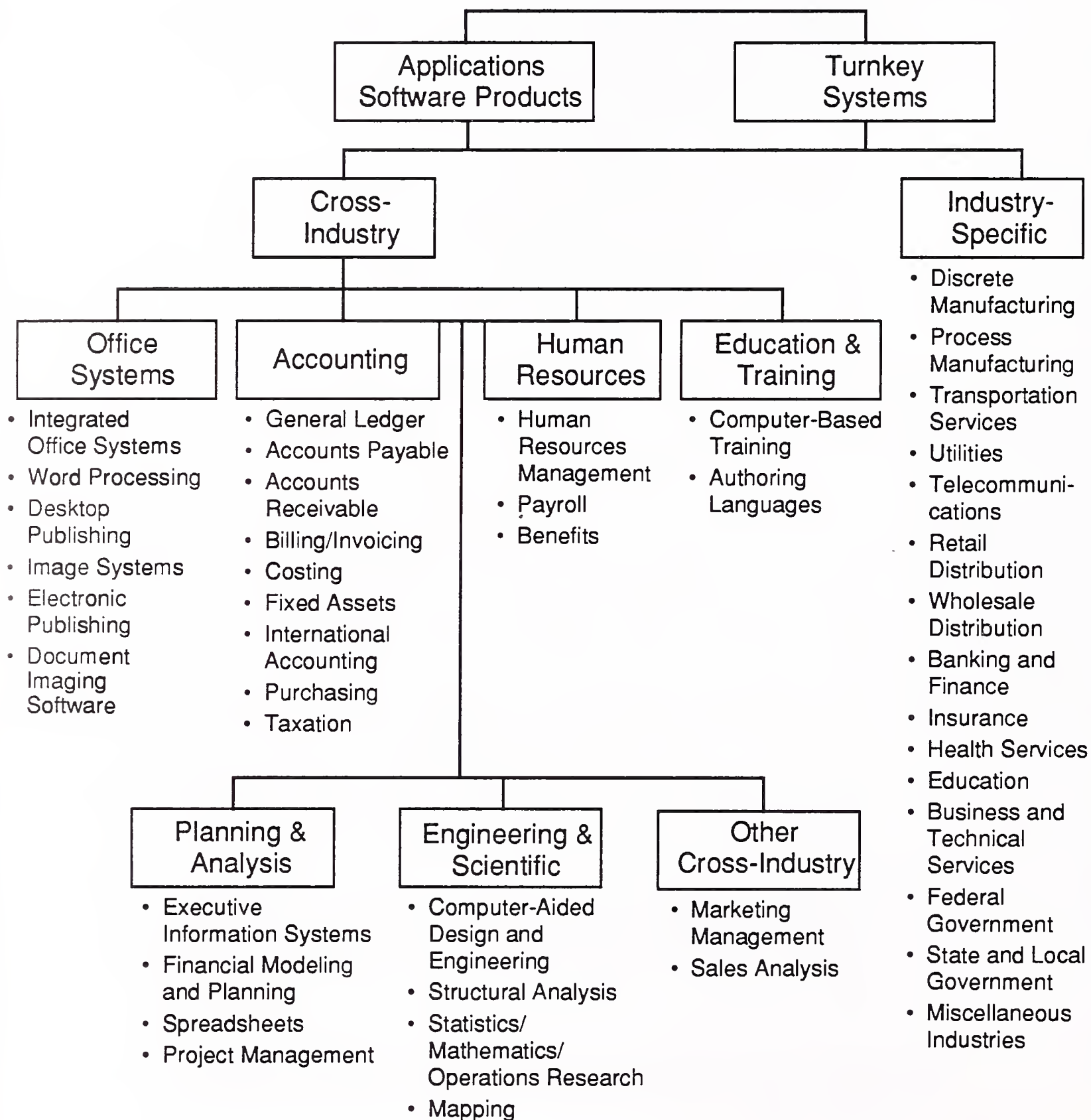
Applications software products enable a user or group of users to support an operational or administrative process within an organization. Examples include accounts payable, order entry, project management and office systems. INPUT categorizes applications software products into two groups of market sectors. (See Exhibit 4.)

- *Industry Applications Software Products* - Software products that perform functions related to fulfilling business or organizational needs unique to a specific industry (vertical) market and sold to that market only. Examples include demand deposit accounting, MRPII, medical record keeping, automobile dealer parts inventory, etc.
- *Cross-Industry Applications Software Products* - Software products that perform a specific function that is applicable to a wide range of industry sectors. Examples include payroll and human resource systems, accounting systems, word processing and graphics systems, spreadsheets, etc.

INPUT also forecasts the applications software products delivery mode by platform level: mainframe, minicomputer and workstation/PC.

EXHIBIT 4

Application Products and Turnkey Systems



2. Turnkey Systems

A turnkey system is an integration of equipment (CPU, peripherals, etc.), systems software, and packaged applications software into a single product developed to meet a specific set of user requirements. Value added by the turnkey system vendor is primarily in the software and professional services provided. INPUT categorizes turnkey systems into two groups of market sectors as it does for applications software products. (See Exhibit 4.)

Most CAD/CAM systems and many small business systems are turnkey systems. Turnkey systems utilize standard computers and do not include specialized hardware such as word processors, cash registers, process control systems, or embedded computer systems for military applications.

Computer manufacturers (e.g., IBM or DEC) that combine software with their own general-purpose hardware are not classified by INPUT as turnkey vendors. Their software revenues are included in the appropriate software category.

Most turnkey systems are sold through channels known as value-added resellers.

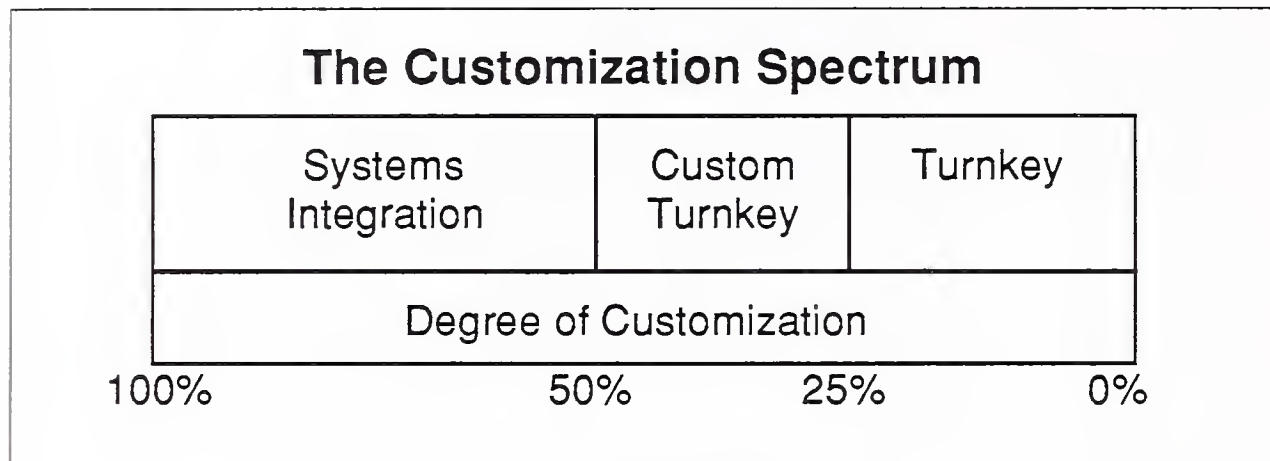
- *Value-Added Reseller (VAR)*: A VAR adds value to computer hardware and/or software and then resells it to an end user. The major value added is usually applications software for a vertical or cross-industry market, but also includes many of the other components of a turnkey systems solution, such as professional services, software support, and applications upgrades.

Turnkey systems have three components:

- Equipment - computer hardware supplied as part of the turnkey system
- Software products - prepackaged systems and applications software products
- Professional services - services to install or customize the system or train the user, provided as part of the turnkey system sale

Exhibit 5 contrasts turnkey systems with systems integration. Turnkey systems are based on available software products that a vendor may modify to a modest degree.

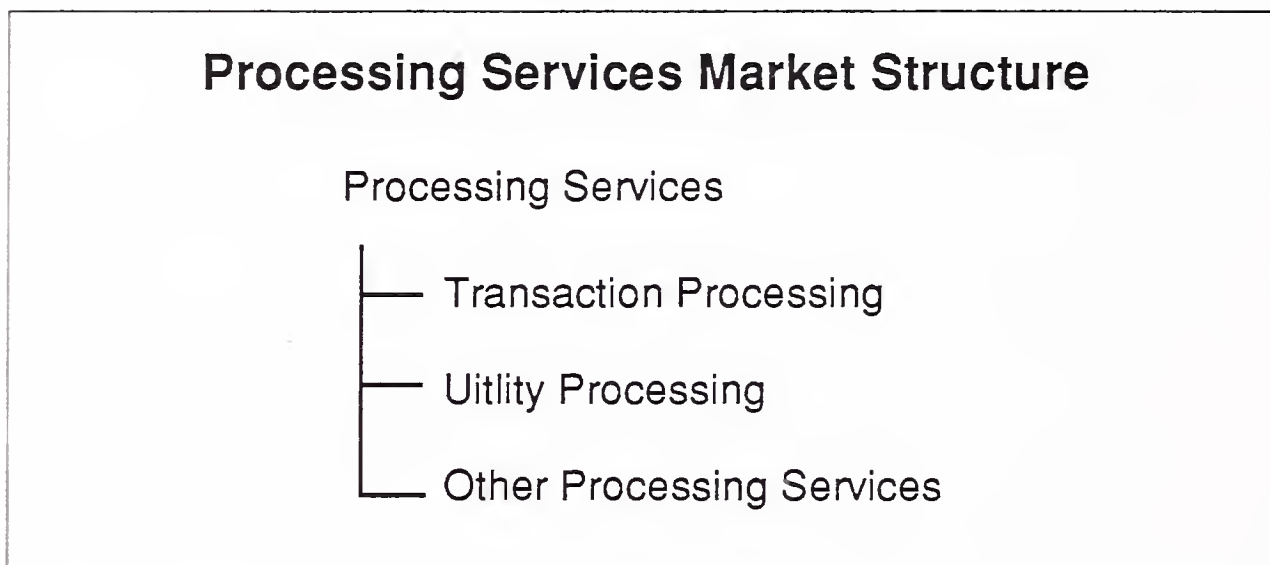
EXHIBIT 5



3. Processing Services

This delivery mode includes three submodes: transaction processing, utility processing, and “other” processing services. See Exhibit 6.

EXHIBIT 6



- *Transaction Processing* - Client uses vendor-provided information systems—including hardware, software and/or data networks—at the vendor site or customer site to process specific applications and update client data bases. The application software is typically provided by the vendor.
- *Utility Processing* - Vendor provides basic software tools (language compilers, assemblers, DBMSs, graphics packages, mathematical models, scientific library routines, etc.), enabling clients to develop and/or operate their own programs or process data on the vendor's system.
- *Other Processing Services* - Vendor provides service—usually at the vendor site—such as scanning and other data entry services, laser printing, computer output microfilm (COM), CD preparation and other data output services, backup and disaster recovery, etc.

4. Systems Operations

Systems operations as a delivery mode was introduced in the 1990 Market Analysis and Systems Operations programs. Previously called Facilities Management, this delivery mode was created by taking the Systems Operations submode out of both Processing Services and Professional Services. For 1992 the submodes have been defined as follows.

Systems operations involves the operation and management of all or a significant part of the client's information systems functions under a long-term contract. These services can be provided in either of four distinct submodes where the difference is whether the support of applications, as well as data center operations, is included.

- *Platform systems operations* - The vendor manages and operates the computer systems, to perform the client's business functions, without taking responsibility for the client's application systems.
- *Applications systems operations* - The vendor manages and operates the computer systems to perform the client's business functions, and is also responsible for maintaining, or developing and maintaining, the client's application systems.
- *Network Management* - The vendor assumes responsibility for operating and managing the client's data communications systems. This may also include the voice communications of the client. A network management outsourcing contract may include only the management services or the full costs of the communications services and equipment plus the management services.
- *Desktop Services* - The vendor assumes responsibility for the deployment, maintenance, and connectivity among the personal computers and/or workstations in the client organization. The services may also include performing the help-desk function. Equipment as well as services can be part of a desktop services outsourcing contract.

Note: This type of client service can also be provided through traditional professional services where the contractual criteria of outsourcing are not present.

Systems operations vendors now provide a wide variety of services in support of existing information systems. The vendor can plan, control, provide, operate, maintain and manage any or all components of the client's information systems environment (equipment, networks, applications systems), either at the client's site or the vendor's site.

Note: In the federal government market, systems operation services are also defined by equipment ownership with the terms “COCO” (Contractor-Owned, Contractor-Operated), and “GOCO” (Government-Owned, Contractor-Operated).

5. Systems Integration (SI)

Systems integration is a vendor service that provides a complete solution to an information system, networking or automation development requirement through the custom selection and implementation of a variety of information system products and services. A systems integrator is responsible for the overall management of a systems integration contract and is the single point of contact and responsibility to the buyer for the delivery of the specified system function, on schedule and at the contracted price. (Refer to Exhibit 7.)

The components of a systems integration project are the following:

- *Equipment* - information processing and communications equipment required to build the systems solution. This component may include custom as well as off-the-shelf equipment to meet the unique needs of the project. The systems integration equipment category excludes turnkey systems by definition.
- *Software products* - prepackaged applications and systems software products.
- *Professional services* - the value-added component that adapts the equipment and develops, assembles, or modifies the software and hardware to meet the system's requirements. It includes all of the professional services activities required to develop, implement, and if included in the contract, operate an information system, including consulting, program/project management, design and integration, software development, education and training, documentation, and systems operations and maintenance.
- *Other services* - most systems integration contracts include other services and product expenditures that are not classified elsewhere. This category includes miscellaneous items such as engineering services, automation equipment, computer supplies, business support services and supplies, and other items required for a smooth development effort.

EXHIBIT 7

Products/Services in Systems Integration Projects

Equipment

- Information systems
- Communications

Software Products

- Systems software
- Applications software

Professional Services

- Consulting
 - Feasibility and trade-off studies
 - Selection of equipment, network and software
- Program/project management
- Design/integration
 - Systems design
 - Installation of equipment, network, and software
 - Demonstration and testing
- Software development
 - Modification of software packages
 - Modification of existing software
 - Custom development of software
- Education/training and documentation
- Systems operations/maintenance

Other Miscellaneous Products/Services

- Site preparation
- Data processing supplies
- Processing/network services
- Data/voice communication services

6. Professional Services

This category includes four submodes: consulting, education and training, software development, and applications management. Exhibit 8 provides additional detail.

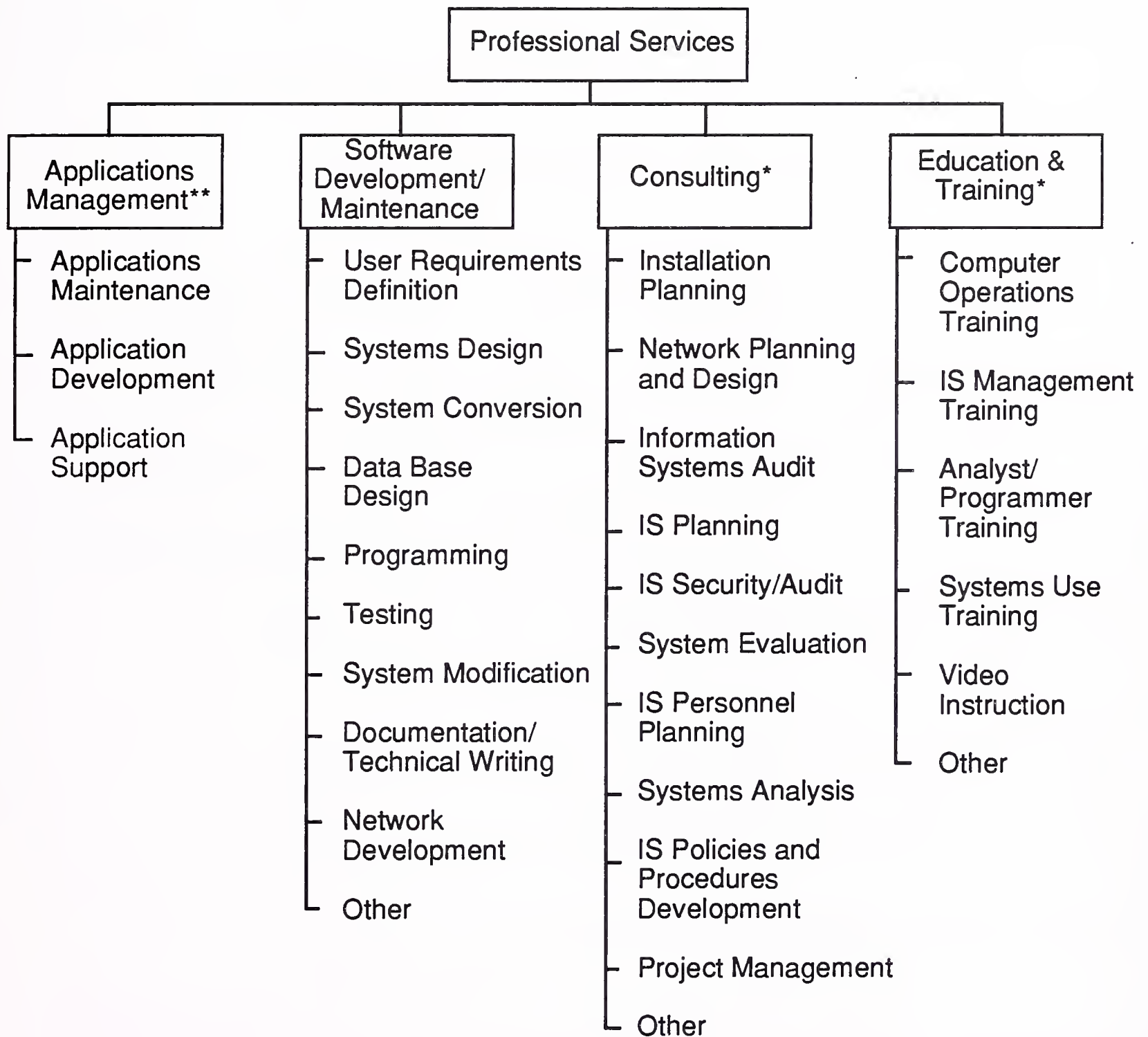
- *Consulting:* Services include management consulting (related to information systems), information systems re-engineering, information systems consulting, feasibility analysis and cost-effectiveness studies, and project management assistance. Services may be related to any aspect of the information system, including equipment, software, networks and systems operations.
- *Education and Training:* Services that provide training and education or the development of training materials related to information systems and services for the information systems professional and the user, including computer-aided instruction, computer-based education, and vendor instruction of user personnel in operations, design, programming, and documentation. Education and training provided by school systems is not included. General education and training products are included as a cross-industry market sector.
- *Software Development:* Services include user requirements definition, systems design, contract programming, documentation, and implementation of software performed on a custom basis. Conversion and maintenance services are also included.
- *Applications Management:* The vendor has full responsibility for maintaining and upgrading some or all of the application systems that a client uses to support business operations and may develop and implement new application systems for the client.

An applications management contract differs from traditional software development in the form of the client/vendor relationship. Under traditional software development services the relationship is project based. Under applications management it is time and function based.

These services may be provided in combination or separately from platform systems operations.

EXHIBIT 8

Professional Services Market Structure



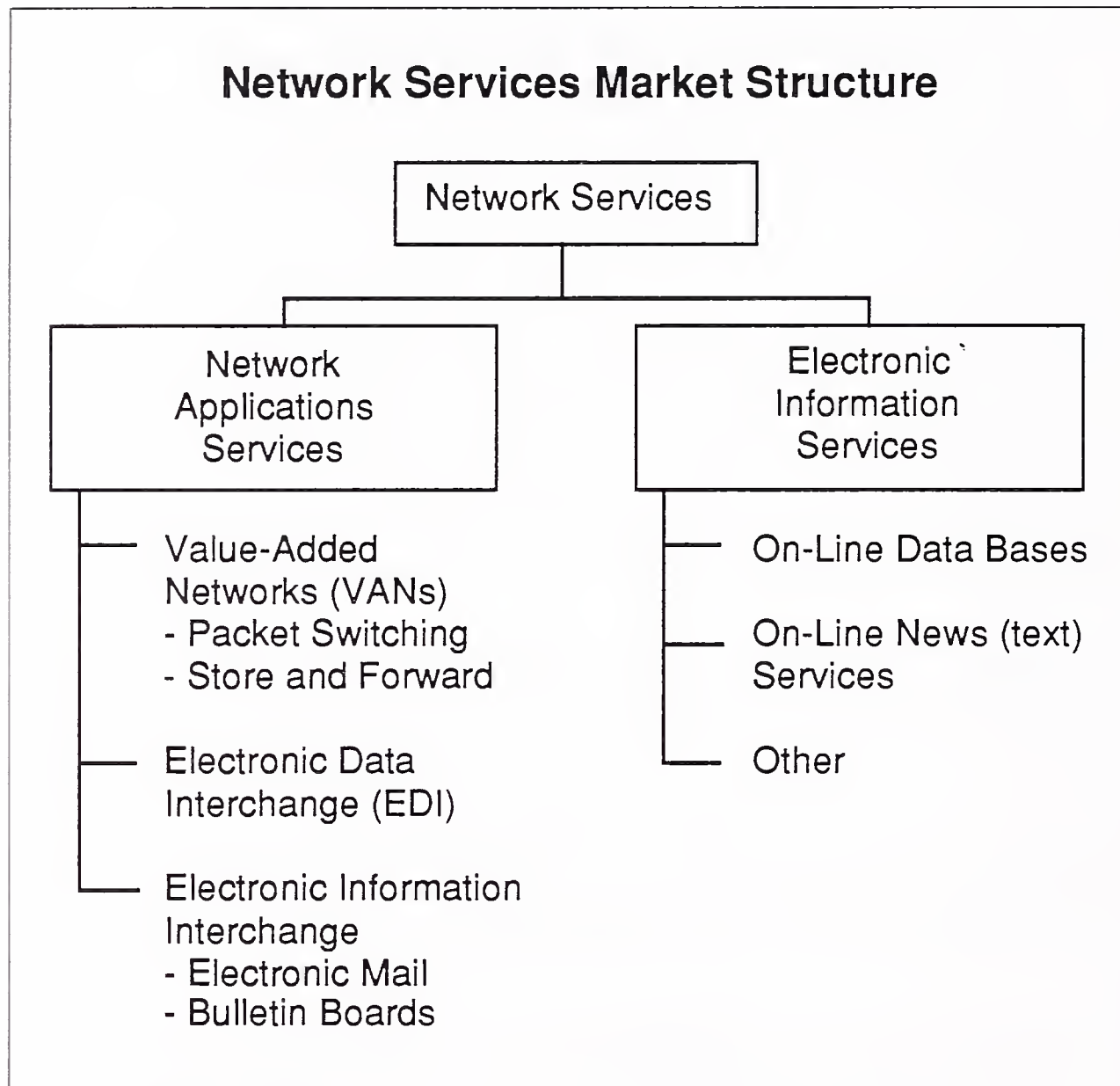
*Related to computer systems, topics, or issues

**Vendor assumes full responsibility on contracted longer term basis

7. Network Services

Network services are a variety of telecommunications-based functions and operations. Network service includes two submodes, as shown in Exhibit 9.

EXHIBIT 9



a. Electronic Information Services

Electronic information services are data bases that provide specific information via terminal- or computer-based inquiry, including items such as stock prices, legal precedents, economic indicators, periodical literature, medical diagnosis, airline schedules, automobile valuations, etc. The terminals used may be computers themselves, such as communications servers or personal computers.

Users inquire into and extract information from the data bases. They may load extracted data into their own computer systems; the vendor does not provide data processing or manipulation capability as part of the electronic information service and users cannot update the vendor's data bases. However, the vendor may offer other services (network applications or processing services) that do offer processing or manipulation capability.

The two kinds of electronic information services are:

- *On-line Data Bases* - Structured, primarily numerical data on economic and demographic trends, financial instruments, companies, products, materials, etc.
- Unstructured, primarily textual information on people, companies, events, etc. These are often news services.

While electronic information services have traditionally been delivered via networks, there is a growing trend toward the use of CD ROM optical disks to support or supplant on-line services, and these optical disk-based systems are included in the definition of this delivery mode.

b. Network Applications

Value-Added Network Services (VAN Services) - VAN services are enhanced transport services which involve adding such functions as automatic error detection and correction, protocol conversion, and store-and-forward message switching to the provision of basic network circuits.

While VAN services were originally provided only by specialized VAN carriers (Tymnet, Telenet, etc.), today these services are also offered by traditional common carriers (AT&T, Sprint, etc.). Meanwhile, the VAN carriers have also branched into the traditional common carriers' markets and are offering unenhanced basic network circuits as well.

Electronic Data Interchange (EDI) - Application-to-application electronic exchange of business data between trade partners or facilitators using a telecommunications network.

Electronic Information Interchange - The transmission of messages across an electronic network managed by a services vendor, including electronic mail, voice mail, voice messaging, and access to Telex, TWX, and other messaging services. This also includes bulletin board services.

8. Equipment Services

- The equipment services delivery mode includes two submodes. Both deal with the support and maintenance of computer equipment.
- *Equipment Maintenance* - Services provided to repair, diagnose problems and provide preventive maintenance both on-site and off-site for

- computer equipment. The costs of parts, media and other supplies are excluded. These services are typically provided on a contract basis.
- *Environmental Services* - Composed of equipment and data center related special services such as cabling, air conditioning and power supply, equipment relocation and similar services.

D

Computer Equipment

These definitions have been included to provide the basis for market segmentation in the software products markets.

- *Computer Equipment* - Includes all computer and telecommunications equipment that can be separately acquired with or without installation by the vendor and not acquired as part of an integrated system. Unless otherwise noted in an INPUT forecast, computer equipment is only included where it is part of the purchase of services or software products (e.g., turnkey systems and systems integration).
- *Peripherals* - Includes all input, output, communications, and storage devices (other than main memory) that can be channel connected to a processor, and generally cannot be included in other categories such as terminals.
- *Input Devices* - Includes keyboards, numeric pads, card readers, light pens and track balls, tape readers, position and motion sensors, and analog-to-digital converters.
- *Output Devices* - Includes printers, CRTs, projection television screens, micrographics processors, digital graphics, and plotters
- *Communication Devices* - Includes modem, encryption equipment, special interfaces, and error control
- *Storage Devices* - Includes magnetic tape (reel, cartridge, and cassette), floppy and hard disks, solid state (integrated circuits), and bubble and optical memories
- *Computer Systems* - Includes all processors from personal computers to supercomputers. Computer systems may require type- or model-unique operating software to be functional, but this category excludes applications software and peripheral devices and processors or CPUs not provided as part of an integrated (turnkey) system.
- *Personal computers* - Smaller computers using 8-, 16-, or 32-bit computer technology. Generally designed to sit on a desktop and are portable for individual use. Price generally less than \$5,000.

- *Workstations* - High-performance, desktop, single-user computers often employing Reduced Instruction Set Computing (RISC). Workstations provide integrated, high-speed, local network-based services such as data base access, file storage and back-up, remote communications, and peripheral support. These products usually cost from \$5,000 to \$15,000.
- *Minicomputer or midsize computers* - Minicomputers are generally priced from \$15,000 to \$350,000. Many of the emerging client/server computers are in this category.
- *Mainframe or large computers* - Traditional mainframe and supercomputers costing more than \$350,000.
- *Client/server computing* - Client/server is an architecture that assembles applications software and data bases, systems software, and computer and networking equipment into a usable form for the purpose of leveraging information technology investments.

Broadly defined, it can include any kind of server, such as file servers and network servers, that are accessed by any kind of client, including a nonintelligent terminal. INPUT has elected to use the narrower and newer definition, by which application and data processing is shared between a client and a server. It is through the act of sharing that the greatest benefit is derived in terms of leveraging information technology investments. It is also the cause of the greatest change for vendors and users.

E

Sector Definitions

1. Industry Sector Definitions

INPUT structures the information services market into industry sectors such as process manufacturing, insurance, transportation, etc. The definitions of these sectors are based on the 1987 revision of the Standard Industrial Classification (SIC) code system. The specific industries (and their SIC codes) included under these industry sectors are detailed in Exhibit 10.

INPUT includes all delivery modes except systems software products and equipment services in industry market sectors. See Exhibit 9 and section E-3 (Delivery Mode Reporting by Sector).

Note: SIC code 88 is Personal Households. INPUT does not currently analyze or forecast information services in this market sector.

EXHIBIT 10

Industry Sector Definitions

Industry Sector	SIC Code	Description
Discrete Manufacturing	23xx	Apparel and other finished products
	25xx	Furniture and fixtures
	27xx	Printing, publishing and allied industries
	31xx	Leather and leather products
	34xx	Fabricated metal products, except machinery and transportation equipment
	35xx	Industrial and commercial machinery and computer equipment
	36xx	Electronic and other electrical equipment and components, except computer equipment
	37xx	Transportation equipment
	38xx	Instruments; photo/med/optical goods; watches/clocks
	39xx	Miscellaneous manufacturing industry
Process Manufacturing	10xx	Metal mining
	12xx	Coal mining
	13xx	Oil and gas extraction
	14xx	Mining/quarrying nonmetallic minerals
	20xx	Food and kindred products
	21xx	Tobacco products
	22xx	Textile mill products
	24xx	Lumber and wood products, except furniture
	26xx	Paper and allied products
	28xx	Chemicals and allied products
	29xx	Petroleum refining and related industries
	30xx	Rubber and miscellaneous plastic products
	32xx	Stone, clay, glass and concrete products
	33xx	Primary metal industries
Transportation Services	40xx	Railroad transport
	41xx	Public transit/transport
	42xx	Motor freight transport/warehousing
	43xx	U.S. Postal Service
	44xx	Water transportation
	45xx	Air transportation (including airline reservation services in 4512)
	46xx	Pipelines, except natural gas
	47xx	Transportation services (including 472x, arrangement of passenger transportation)

EXHIBIT 10 (CONT.)

Industry Sector Definitions

Industry Sector	SIC Code	Description
Telecommunications	48xx	Communications
Utilities	49xx	Electric, gas and sanitary services
Retail Distribution	52xx	Building materials
	53xx	General merchandise stores
	54xx	Food stores
	55xx	Automotive dealers, gas stations
	56xx	Apparel and accessory stores
	57xx	Home furniture, furnishings and accessory stores
	58xx	Eating and drinking places
	59xx	Miscellaneous retail
Wholesale Distribution	50xx	Wholesale trade - durable goods
	51xx	Wholesale trade - nondurable goods
Banking and Finance	60xx	Depository institutions
	61xx	Nondepository credit institutions
	62xx	Security and commodity brokers, dealers, exchanges and services
	67xx	Holding and other investment offices
Insurance	63xx	Insurance carriers
	64xx	Insurance agents, brokers and services
Health Services	80xx	Health services
Education	82xx	Educational services

EXHIBIT 10 (CONT.)

Industry Sector Definitions

Industry Sector	SIC Code	Description
Business Services	65xx	Real estate
	70xx	Hotels, rooming houses, camps, and other lodging places
	72xx	Personal services
	73xx	Business services (except hotel reservation services in 7389)
	7389x	Hotel reservation services
	75xx	Automotive repair, services and parking
	76xx	Miscellaneous repair services
	78xx	Motion pictures
	79xx	Amusement and recreation services
	81xx	Legal services
	83xx	Social services
	84xx	Museums, art galleries, and botanical/zoological gardens
	86xx	Membership organizations
	87xx	Engineering, accounting, research, management, and related services
	89xx	Miscellaneous services
Federal Government	9xxx	
State and Local Government	9xxx	
Miscellaneous Industries	01xx	Agricultural production - crops
	02xx	Agricultural production - livestock/animals
	07xx	Agricultural services
	08xx	Forestry
	09xx	Fishing, hunting and trapping
	15xx	Building construction - general contractors, operative builders
	16xx	Heavy construction - contractors
	17xx	Construction - special trade contractors

2. Cross-Industry Sector Definitions

INPUT has identified seven cross-industry market sectors. These sectors or markets involve multi-industry applications such as human resource systems, accounting systems, etc.

- In order to be included in an industry sector, the service or product delivered must be specific to that sector only. If a service or product is used in more than one industry sector, it is counted as cross-industry.
- INPUT only includes the turnkey systems, applications software products, and transaction processing services in the cross-industry sectors.

The seven cross-industry markets are:

Accounting - consists of applications software products and information services that serve such functions as:

- General ledger
 - Financial management
 - Accounts payable
 - Accounts receivable
 - Billing/invoicing
 - Fixed assets
 - International accounting
 - Purchasing
 - Taxation
 - Financial consolidation
- Excluded are accounting products and services directed to a specific industry, such as tax processing services for CPAs and accountants within the business services industry sector.

Human Resources - consists of application solutions purchased by multiple industry sectors to serve the functions of human resources management and payroll. Examples of specific applications within these two major functions are:

- Employee relations
- Benefits administration
- Government compliance
- Manpower planning
- Compensation administration
- Applicant tracking
- Position control
- Payroll processing

Education and Training - consists of education and training for information systems professionals and users of information systems delivered as a software product, turnkey system or through processing services. The market for computer-based training tools for the training of any employee on any subject is also included.

Office Systems consists of the following six categories:

Integrated Office Systems (IOSs) - IOSs integrate the applications that perform common office tasks. Typically these tasks include the following core applications, all of which are accessed from the same terminal, microcomputer or workstation:

- Electronic mail
- Decision support systems
- Time management
- Filing systems

IOSs enable office workers to utilize applications that are resident on a number of hosts or servers, thus creating a corporate communication environment through integrating line-of-business software with personal software productivity tools. IOSs capitalize on the cross-platform architectures of major vendors. Major hardware vendors such as IBM, Data General, Digital, Hewlett-Packard and NCR all offer IOSs.

Work flow and groupware products are also included within the IOS definition.

Word Processing - Word processing is the most common microcomputer application and is a basic application within the office systems sector. Word processing addresses several levels of functionality, from the production of simple correspondence to large document generation where many people within different departments have input.

Desktop Publishing (DTP) - Desktop publishing refers to the page-design software programs that allow small and mid-sized organizations to publish printed documents (brochures, catalogs, newsletters, reports, etc.) from the desktop. The primary functions of DTP software include the manipulation of the following functions:

- Layout and design of columns.
- Text manipulation (font type).
- Graphic manipulation.
- Print Control (color type, paper type)

Electronic Publishing - Electronic publishing includes composition, printing, and editing software for documents containing multiple typefaces and graphics including charts, diagrams, computer-aided design (CAD) drawings, line art, and photographs. Electronic publishing products may also have different data formats such as text, graphs, images, voice and video.

The fundamental difference between electronic publishing and desktop publishing is that electronic publishing encompasses a method of document management and control from a single point regardless of how many authors/locations work on a document. Desktop publishing (DTP) on the other hand, is considered a personal productivity tool and is generally a lower-end product residing on a personal computer.

Graphics - Graphics packages that are used for presentations or freehand drawings and/or are ancillary to desktop publishing are part of office systems. Thus, the graphics component of office systems sector includes the following elements:

Presentation graphics represent the bulk of office systems graphics. Most presentations involve a combination of graphs and text. They are used to communicate a series of messages to an audience rather than to analyze data.

Paint and line art drawing programs are used for illustrations while page layout programs are used to integrate text and graphics.

Electronic form programs allow users to create and print forms in-house. Some applications work with OCR scanners allowing users to scan pictures and logos directly on the forms.

Document Imaging Software - The software that allows users to manipulate (store, retrieve, print) images that have been scanned from paper documents. The applications that imaging software generates include: full text retrieval, document management, and database management. Document imaging software is a component of an imaging system. Hardware components of imaging systems include: scanners, image servers, workstations, optical drives, printers, and storage devices.

Engineering and Scientific encompasses the following applications:

- Computer-aided design and engineering (CAD and CAE)
- Structural analysis
- Statistics/mathematics/operations research
- Mapping/GIS
- Computer-aided manufacturing (CAM) or CAD that is integrated with CAM is excluded from the cross-industry sector as it is specific to the manufacturing industries. CAD or CAE that is dedicated to integrated circuit design is also excluded because it is specific to the semiconductor industry.

Planning and Analysis consists of software products and information services in four application areas:

- Executive Information Systems (EIS)
- Financial modeling or planning systems
- Spreadsheets
- Project management

Other encompasses marketing/sales and electronic publishing application solutions.

- Sales and marketing includes:
 - Sales analysis
 - Marketing management
 - Demographic market planning models

3. Delivery Mode Reporting by Sector

This section describes how the delivery mode forecasts relate to the market sector forecasts. Exhibit 11 summarizes the relationships.

- *Processing services* - The transaction processing services submode is forecasted for each industry and cross-industry market sector. The utility and other processing services submodes are forecasted in total market in the general market sector.
- *Turnkey systems* - Turnkey systems is forecasted for the 15 industry and 7 cross-industry sectors. Each component of turnkey systems is forecasted in each sector.

EXHIBIT 11

Delivery Mode versus Market Sector Forecast Content

Delivery Mode	Submode	Market Sectors		
		Industry Sectors	Cross-Industry Sectors	General
Processing Services	Transaction Utility Other	X	X	X X
Turnkey Systems		X	X	
Applications Software Products		X	X	
Systems Operations	Platform Applications	X X		
Systems Integration		X		
Professional Services		X		
Network Services	Network Applications Electronic Information Services	X X		X
Systems Software Products				X
Equipment Services				X

- *Applications software products* - The applications software products delivery mode is forecasted for the 15 industry and 7 cross-industry sectors. In addition, each forecast is broken down by platform level: mainframe, minicomputer and workstation/PC.
- *Systems operations* - Each of the systems operations submodes is forecasted for each of the 15 industry sectors.
- *Systems integration* - Systems integration and each of the components of systems integration are forecasted for each of the 15 industry sectors.
- *Professional services* - Professional services and each of the submodes is forecasted for each of the 15 industry sectors.

- *Network services* - The network applications submode of network services forecasted for each of the 15 industry sectors.

Industry and cross-industry electronic information services are forecast in relevant market sectors. The remainder of electronic information services is forecasted in total for the general market sector.

- *Systems software products* - Systems software products and its submodes are forecasted in total for the general market sector. Each submode forecast is broken down by platform level: mainframe, minicomputer and workstation/PC.
- *Equipment services* - Equipment services and its submodes are forecasted in total in the general market sectors.

F

Vendor Revenue and User Expenditure Conversion

The size of the information services market may be viewed from two perspectives: vendor (producer) revenues and user expenditures. INPUT defines and forecasts the information services market in terms of user expenditures. User expenditures reflect the markup in producer sales when a product such as software is delivered through indirect distribution channels (such as original equipment manufacturers (OEMs), retailers and distributors). The focus on user expenditure also eliminates the double counting of revenues that would occur if sales were tabulated for both producer (e.g., Lotus) and distributor (e.g., ComputerLand).

For most delivery modes, vendor revenues and user expenditures are fairly close. However, there are some areas of significant difference. Many microcomputer software products, for example, are marketed through distribution channels. To capture the value added through these distribution channels, adjustment factors are used to convert estimated information services vendor revenues to user expenditures.

For some delivery modes, including software products, systems integration and turnkey systems, there is a significant volume of intra-industry sales. For example, systems integrators purchase software and subcontract the services of other professional services vendors. Turnkey vendors incorporate purchased software into the systems they sell to users.

To account for such intra-industry transactions, INPUT uses conversion ratios to derive the estimate of end-user expenditures.

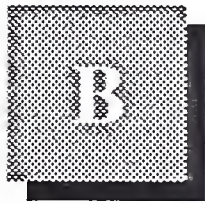
Exhibit 12 summarizes the net effect of the various ratios used by INPUT to convert vendor revenues to user expenditure (market size) figures for each delivery mode.

EXHIBIT 12

Vendor Revenue to User Expenditure Conversion

Delivery Mode	Vendor Revenue Multiplier
Applications Software Products	1.18
Systems Software Products	1.10
Systems Operations	0.95
Systems Integration	0.95
Professional Services	0.99
Network Services	0.99
Processing Services	0.99
Turnkey Systems	0.95
Equipment Services	0.99

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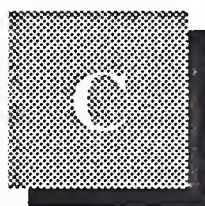
Respondent Profile

EXHIBIT B-1

Respondent Profile

Number of User Respondents	Market Sector
28	Process Manufacturers
15	Discrete Manufacturers
25	Finance and Banking Organizations
23	Insurance Companies
20	Wholesale Distributors
12	Utilities
10	Business Services Firms
7	Retail Distributors
29	Other Firms and Federal Government Organizations
169	Total

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Forecast Data Base

EXHIBIT C-1

Canadian Information Services Industry Market Size by Delivery Mode, 1993-1998

Delivery Modes	1992	Growth 92-93 (%)	1993	1994	1995	1996	1997	1998	CAGR 93-98 (%)
Total Canada Information Services Market	4,858	10	5,332	5,865	6,476	7,181	7,937	8,805	11
<i>Processing Services</i>	685	2	697	711	719	728	740	752	2
- Transaction Processing Services	418	3	424	431	436	443	449	458	2
- Utility Processing	233	2	237	242	244	245	246	247	1
- Other Processing	34	6	36	38	39	40	44	47	5
<i>Network/Electronic Information Services</i>	250	14	285	328	380	439	508	587	16
- Electronic Information Services	89	13	101	116	135	155	179	206	15
- Network Applications	161	14	184	212	245	284	329	381	16
<i>Applications Software Products</i>	698	14	796	887	996	1,118	1,254	1,404	12
- Mainframe	188	9	204	216	226	233	239	256	5
- Minicomputer	211	10	233	253	272	287	299	307	6
- Workstation/PC	299	20	359	418	498	598	716	841	19
<i>Systems Software Prod.</i>	659	10	722	793	873	960	1,057	1,162	10
- Mainframe	303	8	328	356	381	407	428	446	6
- Minicomputer	221	6	235	251	272	294	321	350	8
- Workstation/PC	135	18	159	186	220	259	308	366	18
<i>Turnkey Systems</i>	320	5	336	352	368	387	405	424	5
- Equipment	106	3	109	113	117	123	128	132	4
- Software	178	6	188	197	206	216	225	236	5
- Professional Services	36	8	39	42	45	48	52	56	8
<i>Systems Integration</i>	760	9	831	917	1,012	1,118	1,237	1,367	10
- Equipment	311	7	333	358	384	414	445	480	8
- Software	145	9	158	171	186	202	220	243	9
- Professional Services	267	12	300	345	396	452	518	586	14
- Other Services	37	8	40	43	46	50	54	58	8
<i>Systems Operations</i>	296	20	354	426	514	619	746	900	21
- Platform	142	18	167	196	231	275	321	370	17
- Applications	154	21	187	230	283	344	425	530	23
<i>Professional Services</i>	1,184	10	1,309	1,453	1,614	1,792	1,990	2,209	11
- Consulting	428	12	478	539	608	685	773	870	13
- Software Development	553	9	604	660	717	778	845	917	9
- Education & Training	203	12	227	254	289	329	372	422	13

EXHIBIT C-2

Canadian Information Services Industry 1993 Data Base Reconciliation

Delivery Modes	1992 Market				1997 Market				92-97 CAGR per data 92 Rpt (%)	92-97 CAGR per data 93 Rpt (%)
	1992 Report (Fcst) (\$M)	1993 Report (Actual) (\$M)	Variance from 1992 Report		1992 Report (Fcst) (\$M)	1993 Report (Fcst) (\$M)	Variance from 1992 Report			
			(\$M)	(%)			(\$M)	(%)		
Sector Total	4,927	4,858	-69	-1	8,161	7,937	224	-3	11	10
Processing Services	705	685	-20	-3	790	740	-50	-6	2	2
Turnkey Systems	323	320	-3	-1	411	405	-6	-1	5	5
Applications Software Products	726	698	-28	-4	1,366	1,254	-112	-8	13	12
Systems Operations	306	296	-10	-3	811	746	-65	-8	22	20
Systems Integration	760	760	0	0	1,145	1,237	92	8	9	10
Professional Services	1,199	1,190	-9	-1	2,070	1,990	-80	-4	12	11
Network Services	247	250	3	1	508	533	25	5	17	15
Systems Software Products	661	659	-2	-1	1,035	1,057	22	2	9	10

